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OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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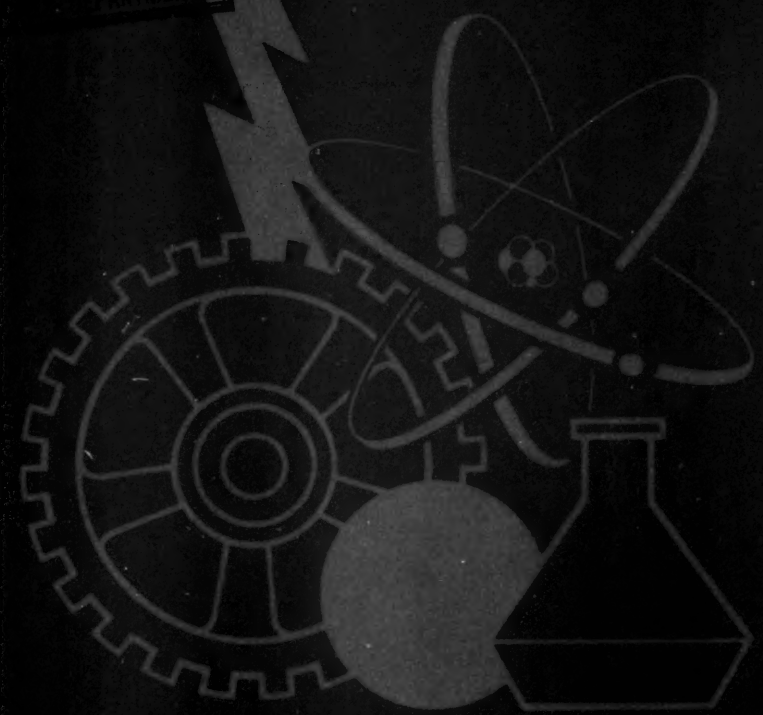
PATENTS

November 14, 1978



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

November 14, 1978 Volume 976 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) Implementation: Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of May 16, 1978.

LUTRELLE F. PARKER,
May 2, 1978. *Acting Commissioner of Patents and Trademarks.*

Priority Documents for the Swedish Patent Office

In connection with its new patent law, enacted on June 1, 1978, the Swedish Patent Office adopted a rule asking for priority documents in microfiche form. We have been advised by the Deputy Director General of the Swedish Patent Office that this rule has been rescinded. Applicants should continue to submit to the Swedish Patent Office priority documents in hard copy (paper) form.

DONALD W. BANNER,
Date: Oct. 17, 1978. *Commissioner of Patents and Trademarks.*

Answers to Questions Frequently Asked About the Patent Cooperation Treaty

The following questions have been frequently asked concerning the Patent Cooperation Treaty (PCT). These questions and brief answers thereto are being published in the hope that they will aid in understanding the PCT. As appropriate, additional questions and answers relating to the PCT will be published from time to time.

1. Who can file an international application in the United States Receiving Office?
Answer: An international application may be filed in the United States Receiving Office (Patent and Trademark Office) by any applicant who is a resident or national of the United States of America (PCT Rule 19.1 and 35 U.S.C. 361(a)). The applicant may be either the inventor or the successor in title of the inventor (owner or assignee) for the purpose of filing an international application. However, the laws of the various designated countries regarding the requirements for applicants must also be considered when filing an international application. When the United States is designated, the applicant for the purposes of the United States of America must be the inventor. At the present time the applicant for all other designated countries may be either the inventor or the owner.

2. How can different applicants for different designated countries be indicated on the Request form?
Answer: An explanation may be given by means of the following example. An international application is to be filed designating the United States, Sweden and Switzerland. The assignee is to be the applicant for Sweden and Switzerland as the invention has been assigned to him. For the purposes of the United States, however, the inventor must be the applicant. If in this example, "A" is the assignee and "B" is the inventor, "A" and "B" must both be indicated as applicants, under Box II of the Request form. The name and other identifying information of one applicant would be placed in Box II and a check mark placed in the small box following the phrase "Additional information is contained in supplemental box." The name and other identifying information of the second applicant would be placed in the Supplemental Box on Page 3 of the Request form and entitled "II. Applicant (continued)." "B" as the inventor would also be named in Box III of the Request. Box IX, on page 2 of the Request, is then used to identify different applicants for different designated countries. In Box IX, "A" would be indicated as the applicant for Sweden and Switzerland, and "B" would be indicated as the applicant for the "United States of America." It should be noted that both "A" and "B" must also sign the Request form or a power of attorney if the Request is signed by an attorney or agent.

3. Must at least one of the inventors, who are the applicants for the United States, be a resident or national of a PCT member country in order to have the United States Patent and Trademark Office accept the application at the national stage?
Answer: The answer is yes, however, this question involves two basic issues which must be addressed separately. One issue relates to the requirements for a valid designation of the United States of America. The other issue relates to the requirements of the U.S. national law in order for the U.S. Patent and Trademark Office to accept the international application for the national stage. As to the first issue, PCT Rules 18.3 and 18.4 require that *at least one* of the applicants for each designated State must be a resident or national of a member country of the PCT Union in order for the designation to be valid. As to the second issue, although the designation of the United States of America may be valid for PCT international procedure, the international application will not be accepted at the United States national stage unless the applicant is the inventor (PCT Article 27(3) and 35 U.S.C. 111 and 373). Therefore, at least one of the inventors must be a resident of a PCT member country in order for the international application to enter the national stage in the United States of America. It should be noted, however, that if the owner or assignee is a resident or national of a PCT member country, the owner can be the sole applicant and file an international application designating all current PCT member countries other than the United States of America. Any invalid designation of States for which at least one applicant is not a resident or national of a Contracting State will be deleted by the Receiving Office.

4. What must be done for an international application to enter the national stage at the United States Patent and Trademark Office?
Answer: An international application will enter the national stage at the United States Patent and Trademark Office generally at the expiration of 20 months from the priority date of the application or if no priority claim is made at 20 months from the actual international filing date. When a declaration of unsearchability under PCT Article 17(2)(a) has been issued by the International Searching Authority, however, the date of entry into the national stage is 2 months from the date of mailing of the declaration of unsearchability (PCT Article 22(2)). By the expiration of the relevant date, the applicable requirements under 35 U.S.C. 371(c) must be received by the United States Patent and Trademark Office to avoid abandonment of the application. Entry into the national stage may also occur earlier at the express request of the applicant under the provisions of 35 U.S.C. 371(f). In order that earlier entry into the national stage may take place the applicable requirements of 35 U.S.C. 371(c) must be received by the United States Patent and Trademark Office. Requirements such as the Search Report and any amendments to the claims if they are not available when the other requirements of 35 U.S.C. 371(c) are met must be submitted promptly after they are made available.

5. Who must sign an international application?
Answer: The Request form of an international application must be signed either by all the applicants (PCT Rule 4.15) or the attorney or agent of all the applicants. In the latter case, a power of attorney signed by all applicants is filed with the international application in the Receiving Office (PCT Rule 2.1).

6. Must a license for foreign filing be obtained in order to file an international application?

Answer: No, a license for foreign filing is not required to file an international application but may be required before the applicant or the U.S. Receiving Office can forward a copy of the international application to a foreign patent office, the International Bureau or other foreign authority (37 CFR 5.11). A foreign filing license to permit transmittal to a foreign office or international authority is not required if the international application does not disclose subject matter in addition to that disclosed in a prior U.S. national application filed more than six months prior to the filing of the international application (37 CFR 5.11(a)(2)). In all other instances, the applicant should request a license for foreign filing (transmittal) (37 CFR 5.12) and if appropriate, identify any additional subject matter in the international application which was not in the earlier U.S. national application (37 CFR 5.14(c)). This request and disclosure information may be supplied on the PCT international application transmittal letter form, PTO–1382, which was published in the October 3, 1978 issue of the OFFICIAL GAZETTE. If no petition or request for a foreign filing license is included in the international application, and it is clear that a license is required in order to timely transmit the Record Copy, it is current Office practice to construe the filing of such an international application to include a request for a foreign filing (transmittal) license. If the license can be granted it will be issued without further correspondence. If no license can be issued, or further information is required, the applicant will be contacted. The automatic request for a foreign filing license does not apply to the filing of foreign national or regional applications outside the PCT.

7. What effect will a secrecy order have if applied to an international application?
Answer: If a secrecy order is applied to an international application, the application will not be forwarded to the International Bureau as long as the secrecy order remains in effect. If the secrecy order remains in effect at the end of the 14th month after the priority date of the international application, the international application will be declared withdrawn (abandoned) because the Record Copy of the international application was not received in time by the International Bureau (37 CFR 5.3(d), PCT Article 12(3), and PCT Rule 22.3). If the United States of America has been designated, however, it is possible to save the U.S. filing date, by fulfilling the requirements of 35 U.S.C. 371(c) prior to the end of the 14th month.

8. Can designations of additional countries be added after an international application is filed?
Answer: No, it is not possible to add designations to an international application after it is filed. Only those countries for which PCT has come into effect may be designated. The Request form, as filed, must contain the names of all designated countries in which protection is desired (PCT Rule 4.9). However, since the designation fees are not required until one year after the priority date, or the actual international application filing date if no priority is claimed (PCT Article 4(1)(ii) and PCT Rule 15.4(b)), applicants may initially designate all PCT countries in which they may have an interest and later only pay designation fees for those countries in which patent protection is seriously desired. Any designated country for which a designation fee is not timely paid is considered withdrawn (PCT Rule 15.5).

9. Can the PCT be used to obtain patent protection under the European Patent Convention (EPC)?
Answer: Yes, a PCT international application may contain the indication that regional patent protection under the EPC is desired for those States that are members of both PCT and EPC. As of October 1, 1978, six European States are members of both the PCT and EPC; they are: France, Federal Republic of Germany, United Kingdom, Sweden, Switzerland and Luxembourg. In order to indicate that EPC protection is desired for these States, the words "Regional Patent" must be placed after the name of the designated States in Box V on the first page of the Request form, e.g., "United Kingdom, Regional Patent." (PCT Administrative Instructions, Section 203). The Netherlands and Belgium, although members of the EPC, cannot be designated in a PCT international application since they have not ratified the PCT.

10. Can the national office of France be designated under the PCT as the office which would grant patent protection?
Answer: No, French national law states that only EPC regional patent protection is available for France if PCT is used. The Receiving Office will treat the designation of France as the wish to obtain EPC regional patent protection for France, even if the indication "Regional Patent" is missing (PCT Administrative Instructions, Section 203). However, if the European Patent Office is not yet examining the subject matter to which the invention relates, the applicant will be permitted to convert the European application to a French national application.

11. Can United States applicants use Chapter II of the PCT which provides for an international preliminary examination report being issued with an opinion on the (1) novelty, (2) inventive step, and (3) industrial applicability, of each claim in the international application?
Answer: No, an applicant filing in the United States Receiving Office cannot use PCT Chapter II since the United States of America did not ratify Chapter II (PCT Article 31(2)(a)).

12. When will the prior art effect of an international application begin in the United States?
Answer: The prior art effect under 35 U.S.C. 102(e) begins on the date the applicant has fulfilled the requirements of 35 U.S.C. 371(c)(1), (2) and (4). These requirements are that the national filing fee, a copy of the international application and a verified English translation thereof, if it was filed in another language, and an oath or declaration be filed in the Patent and Trademark Office. The international application also becomes prior art upon publication, which occurs either promptly after the expiration of 18 months from the priority date, or earlier at applicant's request.

13. When must a "prior art statement" be filed under the PCT?
Answer: If the United States of America is designated, a prior art statement under 37 CFR 1.97 and 1.98 should be filed at the time of entering the national stage (37 U.S.C. 371(b) or (f)) or within three months thereafter. For purposes of 37 CFR 1.97(a) the date of entry into the national stage is considered to be "the time of filing the application."

14. Who may be contacted within the United States Patent and Trademark Office to answer additional questions on PCT?
Answer: Contacts within the United States Patent and Trademark Office include Mr. Louis O. Maassel, Crystal Plaza 3, Room 11D07, (703)557–3070; Ms. Mary E. Turowski, Crystal Plaza 2, Room 9C26, (703)557–3776; and PCT Receiving Office and Information Center, Crystal Plaza 2, Room 4C08, (703)557–2003.

DONALD W. BANNER,
Oct. 17, 1978. *Commissioner of Patents and Trademarks*

Patent Suits

Notices under 35 U.S.C. 290: Patent Act of 1952

3,097,614. W. J. Duncan, TABLE EXTENSION SLIDE MECHANISM, filed July 26, 1978, D.C., M.D.N.C. (Greensboro), Doc. C–78–330–WS, *Acme Metal Slide, Inc.* v. *Sun Metal Products, Inc.*

3,115,138, McElvenny, Snyder and Sullivan, EVACUATOR, filed Mar. 26, 1965, D.C., N.D. Ind. (Hammond), Doc. 3571, *Mercantile National Bank of Chicago et al.* v. *Quest, Inc. and Paul E. Magers.* Defendants be enjoined and restrained from directly or indirectly manufacturing, selling or inducing manufacture or selling of closed wound suction devices, July 17, 1978.

3,183,845, De Stevens and Werner, DERIVATIVES OF 3,4 DIHYDRO-2-H[1,2,4]-BEN-ZOTHIADIAZINE-1,1 DIOXIDES, filed Oct. 18, 1977, D.C., E.D.N.Y. (Brooklyn), Doc. 77–C–2079, *Ciba-Geigy Corporation* v. *Bolar Pharmaceutical Co.*

3,178,900. R. P. Lamons, FOAM-DIELECTRIC COAXIAL CABLE WITH TEMPERATURE INDEPENDENT RELATIVE CONDUCTOR LENGTH, filed May 23, 1974, D.C. Conn. (New Haven), Doc. N–74–124, *Andrew Corporation* v. *Cable Wave Systems, Inc. et al.* Consent decree, dismissing all

claims asserted in both the complaint and the counterclaims by defendants July 24, 1978.

3,209,401, G. Mehnert, BLOWING NOZZLE FOR BLOWING MACHINES, **filed** July 5, 1978, D.C. Del. (Wilmington), Doc. CA-78-283, *Bekum Maschinenfabriken* v. *Hoover Universal, Inc. and Hoover Ball and Bearing Company.*

3,216,674, W. B. McLean, PROPORTIONAL NAVIGATION SYSTEM FOR A SPINNING BODY IN FREE SPACE; **3,758,051,** D. D. Adams, LOCITY CONTROL AND ORIENTATION OF A INSTABILIZED BODY; **Re. 26,887,** W. B. McLean, PROPORTIONAL NAVIGATION SYSTEM FOR A SPINNING BODY IN FREE SPACE, **filed** Dec. 30, 1977, D.C. Md. (Baltimore), Doc. H-77-2179, *Walter G. Finch* v *Hughes Aircraft Company.*

3,218,824, K. L. Nelson, DIAPHRAGM ACTUATED CONTROL VALVES FOR AN ICE MAKER, **filed** July 21, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c2904, *Nason Telesign Corporation* v. *Bunker Ramo Corporation.*

3,286,992, Armeniades and Johnson and Raphael, MIXING DEVICE, **filed** July 20, 1978, D.C., W.D.N.Y. (Buffalo), Doc. C-78-410, *Kenics Corporation* v. *B. V. Europese Mattschappij Voor Mechanisatie.*

3,316,574, R. L. Pare, ROAD EXPANSION JOINT, **Re. 26,733,** J. A. Welch, ELASTOMERIC EXPANSION JOINT, **filed** Nov. 9, 1972, D.C. Del. (Wilmington), Doc. 4514/4653, *Robert L. Pare and the General Tire & Rubber Company* v. *Watson-Bowman Associates, Inc.* That the complaint and counterclaim and all amendments of each herein be and the same are hereby dismissed, Apr. 25, 1977.

3,340,800, Gruver, Seifried and Johnson, DUAL ROLLER PLATENS IN ADDRESS PRINTING MACHINES, **filed** Aug. 4, 1978, D.C., E.D.N.Y. (Brooklyn), Doc. 78-C-1699, *Addressograph-Multigraph Corp.* v. *Bartizan Corporation.*

3,378,437, Arndt and Steinhausen, ACARICIDAL AGENTS; **3,502,720,** same, N-2-METHYL-4-CHLORAPHENYL-FORMAMIDINES, **filed** July 14, 1978, D.C., N.D. Miss. (Clarksdale), Doc. DC78-86-S-P, *Schering, A.G. Berlin/Berkkamen* v. *Tenatek Marketing, Inc.* **Same, filed** July 12, 1978, D.C., Ariz. (Phoenix), Doc. 78-562-PhX, *Schering, A.G. Berlin/Bergkamen* v. *Corp. Development Inc.*

3,395,061. Covert and Gilbert, METHOD AND APPARATUS FOR MAKING MICROFICHE, **filed** May 17, 1976, D.C., M.D.N.C. (Greensboro), Doc. C-76-235-WS, *Planning Research Corporation* v. *Arcata Microfilm Corporation.* Stipulation and order for dismissal, action dismised with prejudice, July 18, 1978.

3,463,340, A. C. Linstrom, SCREW CAP WITH LOCKING MEANS, **filed** July 26, 1978, D.C., M.D. Fla. (Tampa), Doc. 78-596-C-T.H., *Tropicana Products, Inc.* v. *Suncoast Plastic Closures, Inc.*

3,464,414, H. Sponnoble, MIXING VIAL CONSTRUCTION, **filed** July 12, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c2776, *The Upjohn Company* v. *Abbott Laboratories.*

3,499,710, L. W. Sahey, DOCUMENT FEEDER, **filed** May 17, 1978, D.C., W.D.N.Y. (Buffalo), Doc. C-78-252, *Eastman Kodak Company* v. *Lloyd W. Sahley.* The above has been remanded, July 31, 1978.

3,502,702. (See 3,378,437.)

3,507,861, Goldfarb and Soriano, GAME APPARATUS AND TIME-DELAY; **3,655,656,** E. M. Van Heyningen, CRYSTALLINE CEPHALEXING MONOHYDRATE, **filed** Aug. 30, 1977, D.C.N.J. (Newark), Doc. 77-1804, *Zenith Laboratories, Inc.* v. *Eli Lilly and Company, Inc.* **Same, filed** Feb. 17, 1978, D.C., S.D. Calif. (San Diego), Doc. 78-0109-T, *Eli Lilly and Company* v. *Lou Foucher, Landes Davidson and Ed Bonneront.* **Same, filed** Feb. 17, 1978, D.C., S.D. Calif. (San Diego), Doc. 78-0108-GT, *Eli Lilly and Co.* v. *Fed-Mart Store, Inc. and Fed-Mart Pharmacy.* **Same, filed** Feb. 17, 1978, D.C. Ariz. (Phoenix), Doc. C-78-130-PhX, *Eli Lilly and Company* v. *Dennis E. Dempsey et ux., doing business as Low Cost Drug.* **Same, filed** Feb. 17, 1978, D.C., C.D. Calif. (Los Angeles), Doc. CV78-650-DWW (Kx), *Eli Lilly and Company* v. *Jaye Prescription Pharmacy.* **Same, filed** Feb. 17, 1978, D.C., C.D. Calif. (Los Angeles), Doc. CV78-651-LTI (Gx), *Eli Lilly and Company* v. *Staco Drugs, Inc.* **Same, filed** Feb. 17, 1978, D.C., C.D. Calif. (Los Angeles), Doc. CV78-649-MML (Px), *Eli Lilly and Company* v. *B & B Laboratories, Inc.* **Same, filed** Oct. 13, 1977, D.C., S.D. Fla. (Fort Lauderdale), Doc. 77-4789-C NCR, *Eli Lilly and Company* v. *Generix Drug Corporation.* **Same, filed** Feb. 17, 1978, D.C., S.D. Fla. (West Palm Beach), Doc. 78-738-C-CF, *Eli Lilly and Company* v. *Mason Distributors Inc.* **Same, filed** Oct. 13, 1977, D.C., S.D.N.Y., Doc. 77-C-5005, *Eli Lilly & Company* v. *H. L. Moore Drug Exchange.*

3,650,460, B. P. Lokey, PAPER BAG; **3,687,356,** Goodrich and Waxlax, GUSSETED TYPE BAGS; **3,776,451,** Goodrich and Waxlax, same, **Re. 28,317,** J. J. Goodrich, same, **Re. 28,318,** same, **filed** Jan. 27, 1977, D.C., N.D. Ohio (Cleveland), Doc. C77-99, *St. Regis Paper Company* v. *Chase Bag Company.*

3,655,656. (See 3,507,861.)

3,675,247, J. O. Ferrell, METHOD FOR FABRICATING PANTY HOSE; **Re. 25,360,** E. G. Rice, COMBINATION STOCKING AND PANTY, **filed** Oct. 5, 1976, D.C., M.D.N.C. (Greensboro), Doc. C-76-525-G, *Tights, Inc.* v. *Liberty Hosiery Mills, Inc.* **Same, filed** Nov. 16, 1976, D.C. W.D.N.C. (Asheville), Doc. A-C-76-187, *Tights, Inc.* v. *Winn-Dixie Stores, Inc.* **Same, filed** Dec. 12, 1974, D.C., W.D.N.C. (Asheville), Doc. A-C-74-148, *Tights, Inc.* v. *W. T. Grant Co.* Voluntary dismissal with prejudice, Jan. 6, 1977. **Same, filed** Dec. 12, 1974, D.C., W.D.N.C. (Asheville), Doc. A-C-74-149, *Tights, Inc.* v. *S. S. Kresge Co., doing business as K-Mart Discount Store.* Stipulation of dismissal with prejudice, Jan. 6, 1977. **Same, filed** Dec. 12, 1974, D.C., W.D.N.C. (Asheville), Doc. A-C-74-143, *Tights, Inc.* v. *J. C. Penney Co., Inc.* Stipulation of dismissal with prejudice, Feb. 17, 1977. **Same, filed** Dec. 12, 1974, D.C., W.D.N.C. (Asheville), Doc. A-C-74-144, *Tights, Inc.* v. *F. W. Woolworth Co.* Stipulation of dismissal with prejudice, Jan. 21, 1977. **Same, filed** Dec. 12, 1974, D.C., W.D.N.C. (Asheville), Doc. A-C-74-145, *Tights Inc.* v. *Sears, Roebuck and Co.* The complaint and counterclaims in this action are dismissed with prejudice, July 1, 1977. **Same, filed** Dec. 12, 1974, D.C., W.D.N.C. (Asheville), Doc. A-C-74-146, *Tights, Inc.* v. *The Great Atlantic & Pacific Tea Company, Inc.* Order that all claims contained in complaint and in the answer and counterclaims are hereby dismissed with prejudice, Feb. 23, 1977. **Same, filed** Dec. 12, 1974, D.C., W.D.N.C. (Asheville), Doc. A-C-74-147, *Tights, Inc.* v. *Rose's Stores, Inc.* The complaint and counterclaims in this action are dismissed with prejudice, July 15, 1977.

3,687,356. (See 3,650,460.)

3,758,051. (See 3,216,674.)

3,776,451. (See 3,650,460.)

Re. 25,360. (See 3,675,247.)

Re. 26,733. (See 3,316,574.)

Re. 26,887. (See 3,216,674.)

Re. 27,990, Rivard and Harley, REFRIGERATORS, **filed** Nov. 22, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c3412, *White Consolidated Industries Inc.* v. *Amana Refrigeration, Inc.* On motion of plaintiff cause and case dismissed, June 9, 1978.

Re. 28,317. (See 3,650,460.)

Re. 28,318. (See 3,650,460.)

Re. 28,640, J. T. Sauriol, METER HOUSING, **filed** Oct. 19, 1977, D.C., N.D. Tex. (Fort Worth), Doc. CA4-77-292, *Intercontinental Plastics Mfg. Co.* v. *D & D and Associates, Inc.* **Same, filed** June 23, 1978, D.C., N.D. Tex. (Fort Worth), Doc. CA4-78-206, *Intercontinental Plastics Mfg. Co.* v. *Brooks Products, Inc.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,343,809, Re. S.N. 944,053, Filed Sep. 19, 1978, Cl. 254/134.3 FT, ROPE PULLING DEVICE, Strohm Newell, Owner of Record: *Inventor,* Attorney or Agent: Neil F. Markva, Ex. Gp.: 323

3,937,283, Re. S.N. 942,182, Filed Sep. 14, 1978, Cl. 166/307, FORMATION FRACTURING WITH STABLE FOAM, Roland E. Blauer, et al., Owner of Record: *Dow Chemical Company, Midland, Mich., and Scientific Software*

Corporation, Denver, Colo., Attorney or Agent: James R. Head, et al., Ex. Gp.: 354

3,982,402, Re. S.N. 944,979, Filed Sep. 22, 1978, Cl. 61/109, SUBMARINE PIPELINE LAYING VESSEL, Alexander Craig Lang, et al., Owner of Record: *Santa Fe International Corporation, Orange, Calif.*, Attorney or Agent: Robert E. Le Blanc, et al., Ex. Gp.: 351

3,982,423, Re. S.N. 945,080, Filed Sep. 25, 1978, Cl. 73/54, MUCUS TESTING PROCESSES AND DEVICES, Samuel R. Schuster, Owner of Record: *Ovutime, Inc., Wellesly, Mass.*, Attorney or Agent: Gerald Altman, Ex. Gp.: 244

3,989,284, Re. S.N. 911,117, Filed May 31, 1978, Cl. 285/332.2, TUBULAR CONNECTION, Thomas L. Blose, Owner of Record: *Hydril Company, Los Angeles, Calif.*, Attorney or Agent: John H. Dodge, II, Ex. Gp.: 351

4,050,707, Re. S.N. 944,200, Filed Sep. 19, 1978, Cl. 280/43.23, LIFTABLE BED TRUCK BODY CONFIGURATION FOR REMOVABLE STORAGE UNIT, Nick P. Glumac, Owner of Record: *Toter-Tee, Inc., Kingsbury, Ind.*, Attorney or Agent: James F. Bryan, Ex. Gp.: 316

PATENT NOTICES

Certificates of Correction for the Week of Nov. 14, 1978

Re. 29,649	4,061,948	4,088,432	4,094,100
D. 247,545	4,062,708	4,088,915	4,094,202
3,794,412	4,066,033	4,088,934	4,094,234
3,917,308	4,067,291	4,088,935	4,094,332
3,927,718	4,068,764	4,088,974	4,094,398
3,938,718	4,069,031	4,089,086	4,094,688
3,953,539	4,069,174	4,089,286	4,094,845
3,954,497	4,069,208	4,089,844	4,094,984
3,993,436	4,071,112	4,090,027	4,095,040
4,001,116	4,071,748	4,090,066	4,095,064
4,008,261	4,072,412	4,090,830	4,095,137
4,017,775	4,072,764	4,090,862	4,095,956
4,024,178	4,074,935	4,091,022	4,095,961
4,032,962	4,075,342	4,091,036	4,095,986
4,035,376	4,075,692	4,091,216	4,096,371
4,035,411	4,076,234	4,091,702	4,096,424
4,036,607	4,078,184	4,091,742	4,096,919
4,040,517	4,078,606	4,091,850	4,097,341
4,044,375	4,079,020	4,091,920	4,098,662
4,045,350	4,080,279	4,092,013	4,099,826
4,045,926	4,080,565	4,092,066	4,112,652
4,046,726	4,080,825	4,092,119	4,113,039
4,047,388	4,080,844	4,092,405	4,113,057
4,052,984	4,081,233	4,092,614	4,113,140
4,053,863	4,082,755	4,092,763	4,113,390
4,054,478	4,083,697	4,093,000	4,113,456
4,056,696	4,084,274	4,093,038	4,113,489
4,057,735	4,084,799	4,093,337	4,114,306
4,057,796	4,085,380	4,093,391	4,114,557
4,058,125	4,086,066	4,093,439	4,115,038
4,058,274	4,086,883	4,093,667	4,115,216
4,059,953	4,087,208	4,093,732	4,115,502
4,060,715	4,087,752	4,093,786	
4,060,834	4,088,004	4,093,789	
4,061,746	4,088,306	4,093,842	

Disclaimers

Reissue No. 28,759.—*Wasyl Bystrianyk*, Hartford, and *Francis A. Sarkozy*, West Hartford, Conn. MOLTEN GLASS GOB DISTRIBUTION SYSTEM. Patent dated Apr. 6, 1976. Disclaimer filed Sept. 5, 1978, by the assignee, *Emhart Industries, Inc.*

Hereby enters this disclaimer to claims 1, 2, 9, 16, 17 and 24 of said patent.

3,597,707.—*Sidney S. C. Chao*, Palo Alto, and *Donald E. Morgan*, Saratoga, Calif. VARIABLE SAMPLE PERIODIC HOLD ELECTRONIC DELAY NETWORK. Patent dated Aug. 3, 1971. Disclaimer filed July 12, 1976, by the assignee, *Ampex Corporation*.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,696,868.—*Donald F. Taylor, Jr.*, Dallas, Tex. WELL FLOW CONTROL VALVES AND WELL SYSTEMS UTILIZING THE SAME. Patent dated Oct. 10, 1972. Disclaimer filed July 12, 1978, by the assignee, *Otis Engineering Corporation*.

Hereby enters this disclaimer to claim 23 of said patent.

3,788,075.—*John W. Holdeman*, Muncie, and *Kenneth G. McMillan*, deceased, New Castle, Ind., *Leanne S. McMillan*, administratrix, Fort Wayne, Ind. VALVE MECHANISM. Patent dated Jan. 29, 1974. Disclaimer filed Sept. 25, 1978, by the assignee, *Borg-Warner Corporation*.

Hereby enters this disclaimer to claims 1 through 18 of said patent.

3,799,863.—*Rashid A. Zeineh*, Chicago, Ill. ELECTROPHORESIS AND ELECTROFOCUSING APPARATUS. Patent dated Mar. 26, 1974. Disclaimer filed May 18, 1978, by the inventor.

Hereby enters this disclaimer to claims 1, 2, 3 and 7 of said patent.

3,816,761.—*Adel Abdel Aziz Ahmed*, Clinton Township, county of Hunterdon, N.J. COMPARATOR CIRCUITRY. Patent dated June 11, 1974. Disclaimer filed Sept. 22, 1978, by the assignee, *RCA Corporation*.

Hereby enters this disclaimer to claim 13 of said patent.

3,828,864.—*Edwin Haverkamp*, Grandville, and *George J. Morren*, Zeeland, Mich. PILE DRIVER AND EXTRACTOR. Patent dated Aug. 13, 1974. Disclaimer filed Sept. 13, 1978, by the assignee, *H & M Vibro, Inc.*

Hereby enters this disclaimer to claims 1–17 of said patent.

3,948,935.—*Michel Sauli*, Paris, France. PYRAZOLINE DERIVATIVES. Patent dated Apr. 6, 1976. Disclaimer filed Sept. 12, 1978, by the assignee, *Rhone Poulenc S.A.*

Hereby enters this disclaimer to all claims of said patent.

4,053,730.—*David Alan Baron*, Edina, *Donald Carl Naab*, Plymouth, and *James Ronald Hampton*, Brooklyn Center, Minn. MICROWAVE OVEN SHAFT SEAL. Patent dated Oct. 11, 1977. Disclaimer filed Sept. 20, 1978, by the assignee, *Litton Systems, Inc.*

Hereby enters this disclaimer to claims 1–4 of said patent.

4,062,471.—*Walter Merton Perry*, deceased, Darien, Conn., by *Elizabeth D. Perry*, executrix. CONTAINER WITH ATTACHED CLOSURE. Patent dated Dec. 13, 1977. Disclaimer filed Aug. 14, 1978, by the assignee, *The Continental Group, Inc.*

The term of this patent subsequent to Oct. 4, 1994 has been disclaimed.

4,075,186.—*Richard J. Ambrose*, Akron, and *Robert A. Hayes*, Cuyahoga Falls, Ohio. GRAFT COPOLYMERS OF POLYBUTADIENE AND SUBSTITUTED POLYACRYLATE. Patent dated Feb. 21, 1978. Disclaimer filed Aug. 21, 1978, by the assignee, *The Firestone Tire & Rubber Company*.

Hereby enters this disclaimer to claims 1 to 14 of said patent.

4,069,389.—*John B. Ashe* and *Gwilym H. Williams*, Palatine, and *Kenneth L. Sypal*, Glen Ellyn, Ill. APPARATUS FOR MINIMIZING RADIATION EXPOSURE AND IMPROVING RESOLUTION IN RADIATION IMAGING DEVICES. Patent dated June 20, 1978. Disclaimer filed June 19, 1978, by the assignee, *G. D. Searle & Co.*

Hereby enters this disclaimer to all claims of said patent.

Dedications

Design No. 238,228.—*Johnny C. Elkins* and *Marvin C. Hanz*, San Angelo, Tex. END STANDARD FOR A GUN RACK. Patent dated Dec. 30, 1975. Dedication filed Sept. 11, 1978, by the assignee, *E-Z Mount Corporation*.

Hereby dedicates to the Public the entire remaining term of said patent.

2,948,928.—*Harold Ebneth* and *Hans Falk*, Leverkusen, Germany. PROCESS FOR MANUFACTURING FOAMED POLYURETHANE ARTICLES. Patent dated Aug. 16, 1960. Dedication filed Dec. 13, 1976, by the assignees, *Mobay Chemical Corporation* and *Bayer Aktiengesellschaft*.

Hereby dedicate to the Public the entire remaining term of said patent.

3,973,090.—*Arthur O. Miller*, Dallas, Tex. TELEPHONE NUMBER ASSIGNMENT RECORD VERIFICATION APPARATUS AND METHOD. Patent dated Aug. 3, 1976. Dedication filed Sept. 1, 1978, by the assignee, *Hewlett-Packard Company*.

Hereby dedicates to the Public the entire remaining term of said patent.

Disclaimer and Dedication

4,003,809.—*Richard K. Lyon*, Fanwood, N.J. ISOTOPE SEPARATION PROCESS. Patent dated Jan. 18, 1977. Disclaimer and dedication filed July 24, 1978, by the assignee, *Exxon Research and Engineering Company*.

Hereby enters this disclaimer and dedicates to the Public the entire remaining term of said patent.

Patents Available for Licensing or Sale

3,924,901. PARTICLE BUILD-UP SUPPRESSOR. Woodrow W. Phillips, 815 North Gilmore Ave., Apt. 105, Lakeland, Fla. 33801.

4,085,488. METHOD AND APPARATUS FOR WINDING AND FORMING COOLING COILS. Benteler-Werke Aktiengesellschaft Werk Neuhaus, Schloss Neuhaus, Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,092,902. LATHE ATTACHMENT FOR GENERATING SPHERICAL SURFACES. Joseph W. Serafin, 222 Flat Hills Road, Amherst, Mass. 01002.

The following patents are offered by: Henry C. Kovar, % The Cornelius Company, 2727 North Ferry St., Anoka, Minn. 55303.

3,283,947. BOTTLE CARRIER.

3,297,196. BOTTLE CARRIER.

3,317,081. BOTTLE CARRIER.

3,334,767. BOTTLE CARRIER FOR SIX-PACKS.

3,363,802. LARGE CAPACITY MOLDED PLASTIC BOTTLE CARRIER.

3,376,998. MOLDED PLASTIC BOTTLE CARRIER.

3,384,261. BOTTLE CARRIER.

3,456,344. PLURAL DRINKING STRAWS INTEGRALLY CONNECTED FUNCTIONING AS A STICK-LIKE SPOON.

3,578,194. THROW-AWAY BEVERAGE BOTTLES.

General Motors Corporation is prepared to grant non-exclusive licenses under the following patents upon reasonable terms.

Applications for licenses may be addressed to the Director Patent Section, General Motors Building, 3044 W. Grand Blvd., Detroit, Mich. 48202.

3,902,824. BLADE LOCK.

3,905,348. SHOCK PROOF ENGINE OVERSPEED CONTROL.

3,915,274. DOUBLE AREA PISTON CLUTCH.

3,919,619. APPARATUS FOR GENERATING THREE-PHASE SINUSOIDAL VOLTAGES.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to: RCA Corporation, Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y. 10036.

4,103,483. ELECTRONIC WRISTWATCH.

4,104,567. TELEVISION RASTER WIDTH REGULATION CIRCUIT.

4,104,569. HORIZONTAL DEFLECTION CIRCUIT WITH AUXILIARY POWER SUPPLY.

4,104,589. CHUCK FOR USE IN THE TESTING OF SEMICONDUCTOR WAFERS.

4,104,832. METHOD FOR FORMING KEEL-TIPPED STYLUS FOR VIDEO DISC SYSTEM.

4,105,298. ELECTRO-OPTIC DEVICES.

4,105,468. METHOD FOR REMOVING DEFECTS FROM CHROMIUM AND CHROMIUM OXIDE PHOTOMASKS.

4,105,654. LIQUID CRYSTALLINE 4-CYANO-OR 4-NITRO-BENZYLIDENE - 4'-(N,N-DIALKYLAMINO)-1-AMINOAZABENZENE DYES.

4,105,901. MONOSTABLE CIRCUIT.

4,105,915. DEFLECTION-TYPE MODULATOR OF LASER BEAM FOR COMMUNICATIONS.

4,105,926. ON-AXIS FILM SCANNER WITH REFLECTED ILLUMINATION.

4,105,944. QUIESCENT BIASING OF R-F POWER TRANSISTORS FOR OTHER THAN CLASS A OPERATION.

4,105,947. PULSE WAVE PHASE AND FREQUENCY DETECTOR.

4,105,948. FREQUENCY SYNTHESIZER WITH RAPIDLY CHANGEABLE FREQUENCY.

4,105,950. VOLTAGE CONTROLLED OSCILLATOR (VCO) EMPLOYING NESTED OSCILLATING LOOPS.

4,105,959. AMPLITUDE BALANCED DIODE PHASE SHIFTER.

4,106,020. FM-CW RADAR RANGING SYSTEM.

4,106,021. POLAR TO RECTANGULAR COORDINATE CONVERTER.

4,106,048. INTEGRATED CIRCUIT PROTECTION DEVICE COMPRISING DIODE HAVING LARGE CONTACT AREA IN SHUNT WITH PROTECTED BIPOLAR TRANSISTOR.

4,106,053. DIGITAL SAMPLING RATE CONVERSION OF COLOR TV SIGNAL.

4,106,059. PHASE LOCKED LOOP TELEVISION TUNING SYSTEM.

4,106,060. ELECTRONIC MAIL BOX.

4,106,086. VOLTAGE MULTIPLIER CIRCUIT.

4,106,107. MIS READOUT DEVICE WITH DIELECTRIC STORAGE MEDIUM.

4,106,532. MACHINE FOR STRAIGHTENING THE WIRE LEADS OF A DEVICE.

4,107,351. METHOD OF DEPOSITING OR REPAIRING A PATTERNED METAL LAYER ON A SUBSTRATE.

4,107,556. SENSE CIRCUIT EMPLOYING COMPLEMENTARY FIELD EFFECT TRANSISTORS.

4,107,680. DIGITALLY PROCESSED RADAR SPEED SENSOR.

4,107,689. SYSTEM FOR AUTOMATIC VEHICLE LOCATION.

4,108,323. MACHINE FOR CHANGING THE SPACING OF A PLURALITY OF WAFERS.

4,108,367. TOKEN AND READER FOR VENDING MACHINES.

4,108,407. ADJUSTMENT DEVICE.

4,108,660. FABRICATION OF DIFFRACTIVE SUBSTRACTIVE FILTER EMBOSSING MASTER.

4,108,686. METHOD OF MAKING AN INSULATED GATE FIELD EFFECT TRANSISTOR BY IMPLANTED DOUBLE COUNTERDOPING.

4,108,793. LIQUID CRYSTAL CELL.

4,109,166. CLAMPING CIRCUIT.

4,109,177. CATHODE-RAY TUBE HAVING APERTURED MASK.

4,109,178. ELECTRON MULTIPLIER WITH SWITCHABLE BEAM CONFINEMENT STRUCTURE.

4,109,191. ROTATOR WITH REMOTE INDICATOR AND SELF-SYNCHRONIZATION.

4,109,202. TRAFFIC SWITCHING IN COMMUNICATIONS SATELLITES.

4,109,209. PULSE STAGGERING CIRCUIT.

4,109,242. MATRIX ADDRESS SYSTEM USING ERASE OPERATION.

4,109,247. CLUTTER FREE COMMUNICATIONS RADAR.

4,109,271. AMORPHOUS SILICON-AMORPHOUS SILICON CARBIDE PHOTOVOLTAIC DEVICE.

4,109,276. MEMORY READ/WRITE ORGANIZATION FOR A TELEVISION SIGNAL PROCESSOR.

4,109,283. FREQUENCY COUNTER FOR TELEVISION TUNING SYSTEM.

4,109,299. ELECTRICAL CONNECTION BETWEEN CONDUCTORS ON SPACED PLATES.

4,109,632. GTO IGNITION CIRCUIT.

4,109,919. PACKAGE ACTUATED RECORD EXTRACTING MECHANISM FOR A VIDEO DISC PLAYER.

4,110,259. ELECTROCHROMIC CERMET MATERIAL AND DEVICE INCLUDING THE SAME.

4,110,488. METHOD FOR MAKING SCHOTTKY BARRIER DIODES.

4,110,692. AUDIO SIGNAL PROCESSOR.

4,110,693. LOCKUP INHIBITING ARRANGEMENT FOR A PHASE LOCKED LOOP TUNING SYSTEM.

4,110,700. ELECTRONICALLY TUNABLE MICROWAVE FREQUENCY FET DISCRIMINATOR.

4,110,735. ERROR DETECTION AND CORRECTION.

4,110,784. NOISE REDUCTION APPARATUS.

4,110,785. CLOCK GENERATOR FOR VIDEO SIGNAL PROCESSING.

4,110,787. COMBINED BLANKING LEVEL AND KINESCOPE BIAS CLAMP FOR A TELEVISION SIGNAL PROCESSING SYSTEM.

D248,753. RECORD.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
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Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
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Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF OCTOBER 7, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	11-4-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-16-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	5-1-78
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	10-3-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	9-23-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-16-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	5-6-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-19-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	4-3-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	2-17-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-3-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	10-3-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	12-19-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-28-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	10-31-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures: Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	8-24-77

Expiration of patents: The patents within the range of numbers indicated below expire during October 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,002,192 to 3,007,168, inclusive
Plant Patents..... Numbers 2,095 to 2,100, inclusive

REISSUES

NOVEMBER 14, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

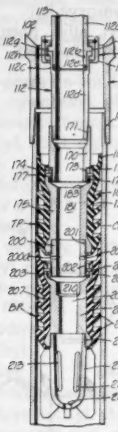
Re. 29,830
CEMENTING PLUG LAUNCHING APPARATUS

Lyle B. Scott, South Gate, Calif., assignor to BJ-Hughes Inc., Long Beach, Calif.

Original No. 3,545,542, dated Dec. 8, 1970, Ser. No. 735,685, Jun. 10, 1968. Application for reissue Jan. 20, 1975, Ser. No. 542,491

Int. Cl.[2] **E21B** *33/12, 33/16*

U.S. Cl. 166—155 **8 Claims**



1. Cementing plug apparatus for use in cementing a well pipe in a well bore comprising: a mandrel, adapter means for connecting said mandrel to the well pipe with said mandrel extending longitudinally in said well pipe, said mandrel having a passage therethrough for the flow of cement into the well pipe, a top cementing plug, releasable means connecting said top plug to said mandrel, a bottom cementing plug, releasable means connecting said bottom plug *directly* to said top plug, [said plugs each having] *means defining* a passage [therethrough] *through each plug* for the flow of cement from said mandrel passage into said well pipe, said bottom plug having means cooperative with a closure member in the cement flowing through said passage in the bottom plug to close the latter passage and effect release of said releasable means connecting said bottom plug to said top plug, and said top plug having means cooperative with a closure member in the cement flowing through said passage in the top plug to close the latter passage and effect release of said releasable means connecting said top plug to said mandrel.

Re. 29,831
FLUID BRAKE CONTROL SYSTEM

Eugene D. McEathron, Watertown, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Original No. 3,967,864, dated Jul. 6, 1976, Ser. No. 606,139, Aug. 20, 1975. Application for reissue May 13, 1977, Ser. No. 796,783

Int. Cl.[2] **B60T** *15/44*

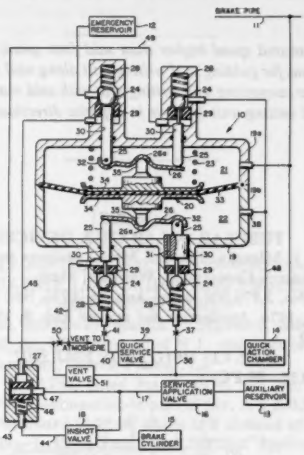
U.S. Cl. 303—81 **8 Claims**

8. Fluid brake control apparatus for a railway vehicle having a brake control pipe, emergency and auxiliary fluid reservoirs, a quick action chamber, a brake cylinder, and service and emergency control valves, wherein an emergency application control device is provided comprising:

a. a housing containing a differential abutment subject to actuation by differences in brake pipe and quick action chamber pressures acting on opposite sides of the abutment.

b. first and second valve means each of the poppet type and each having relatively movable seat and closure elements, each of said first and second valve means having at least one of its said seat and closure elements operatively connected to the abutment,

c. both said first and second valve means being opened by movement of said abutment in response to a decrease in brake fluid pressure relative to quick action chamber pressure occurring at a rate indicative of an emergency brake application,



d. means responsive to the opening of said first valve means for applying fluid from said emergency reservoir to the brake cylinder, and

e. means responsive to the opening of said second valve means for venting said quick action chamber at a controlled rate to ensure that the pressure in said quick action chamber continues to exceed that in said brake pipe and effective on one side of said abutment for at least a predetermined time to thereby prevent closure of said first valve means throughout said predetermined time.

Re. 29,832
PRINTING MECHANISM

Toshio Hayakawa, Kadoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Original No. 3,929,215, dated Dec. 30, 1975, Ser. No. 513,068, Oct. 8, 1974. Application for reissue Jun. 27, 1977, Ser. No. 810,440

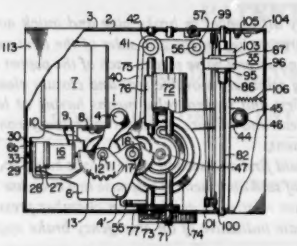
Claims priority, application Japan, Oct. 12, 1973, 48-115241; Oct. 12, 1973, 48-115242; Oct. 12, 1973, 48-115243; Oct. 12, 1973, 48-119322[U]; Oct. 12, 1973, 48-119324[U]; Oct. 12, 1973, 48-119323[U]; Oct. 12, 1973, 48-119325[U]; Oct. 12, 1973, 48-119326[U]; Aug. 20, 1974, 49-99926[U]; Aug. 20, 1974, 49-99927[U]

Int. Cl.[2] **B41J** *3/04*

U.S. Cl. 400—320.1 **17 Claims**

16. A writing mechanism comprising: a writing unit of a non-impact type; means for moving the writing unit along a straight path to scan across each of a plurality of line paths within a sheet of recording paper; a rotatably mounted support; a mangle wheel rotatably mounted on said support and having first and second

toothed portions arranged in an outer and an inner arcuate path to form a continuous loop; a gear engaged with said loop of teeth; drive means for driving said gear whereby said mangle wheel is rotated in one direction at a first speed and in the opposite direc-



tion at a second speed higher than said first speed; writing unit guide means for guiding said writing unit along said straight path; and means connecting said writing unit with said mangle wheel to cause said writing unit to move in opposite directions.

Re. 29,833

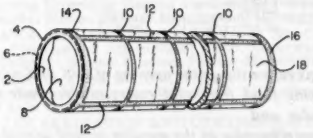
TUBULAR SOLAR CELL DEVICES

Abraham I. Mlavsky, Lincoln, Mass., assignor to Mobil Tyco Solar Energy Corporation, Waltham, Mass.

Original No. 3,976,508, dated Aug. 24, 1976, Ser. No. 519,926, Nov. 1, 1974. Application for reissue Aug. 9, 1977, Ser. No. 823,119

Int. Cl.[2] **H01L** *31/06;* **F24J** *3/02*

U.S. Cl. 136—89 PC **37 Claims**



1. A solar cell unit comprising a tubular semiconductor body having an outer radiation-receiving region of a first conductivity type and an inner region of a second opposite conductivity type separated by a P-N or N-P junction, and [electrically conductive contacts] *first and second electrodes respectively carried on opposite sides of said junction* for coupling said outer and inner regions to an external circuit, *said first electrode comprising a plurality of contacts electrically-connected to one another and to said outer radiation-receiving region.*

Re. 29,834

CATIONIC DYESTUFFS

Alfred Brack, Odenthal, and Ernst Schmitt, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

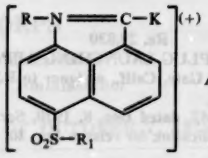
Original No. 3,959,310, dated May 25, 1976, Ser. No. 324,925, Jan. 19, 1973. Application for reissue Jul. 20, 1977, Ser. No. 817,868

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1972, 2202316

Int. Cl.[2] **C07D** *209/90, 209/92, 401/10, 413/10*

U.S. Cl. 260—326.9 **9 Claims**

1. Cationic dyestuff of the formula

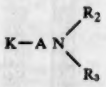


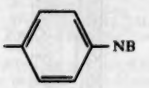
wherein

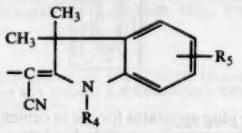
R is hydrogen, methyl, *ethyl,* n-propyl, i-propyl, n-butyl, -cyanoethyl, or -hydroxyethyl;

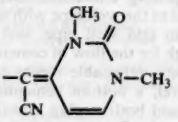
R_1 is methyl, n-butyl, allyl, phenyl, p-tolyl, o-tolyl, p-chlorophenyl, or m-nitrophenyl;

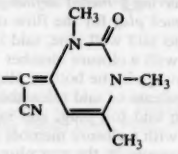
K is

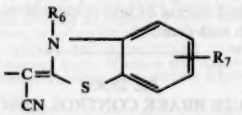


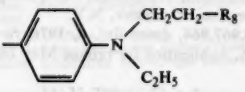


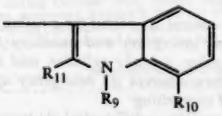




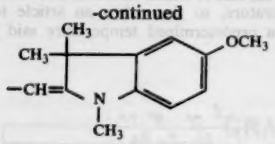








-continued



N-methyl-tetrahydroquinolinyl,
N-ethyl-tetrahydroquinolinyl,
N-β-chloroethyl-tetrahydroquinolinyl,
N-β-cyanoethyl-tetrahydroquinolinyl;
A is p-phenylene, 2,5-diethoxy-p-phenylene, 2,5-dimethoxy-p-phenylene 3-methyl-p-phenylene, 3-methoxy-p-phenylene, 3-chloro-p-phenylene, 3-methoxycarbonyl-amino-p-phenylene, 3-dimethylamido-carbonylamino-p-phenylene, 3-ethoxy-p-phenylene, or 3-methylamido-carbonylamino-p-phenylene;
R_2 is methyl, ethyl, n-propyl, n-butyl, i-butyl, β-chloroethyl, diethylaminoethyl, cyclohexyl, phenyl, p-othoxyphenyl, o-methoxyphenyl, o-tolyl, benzyl, or p-methylbenzyl;
R_3 is hydrogen, methyl, ethyl, n-propyl, or n-butyl;
R_4 is methyl or ethyl;
R_5 is hydrogen, 5-chloro, 5-methoxy, or 5-ethoxy;
R_6 is methyl, ethyl, or n-butyl;
R_7 is hydrogen or 6-methoxy;
R_8 is chloro, cyano, methoxy, methoxycarbonyl, β-ethoxyethyl, β-cyanoethyl, β-hydroxycarbonylethyl, dimethylamino, carbanamido, phenyl, piperidyl, pyrrolidinyl, or morpholinyl;
R_9 is hydrogen or methyl;
R_{10} is hydrogen or ethyl;
R_{11} is methyl or phenyl;
B is the remaining portion of morpholinyl, piperidinyl, pyrrolidinyl, 3-methylpyrazolinyl, 3-phenylpyrazolinyl, or N-β-cyanoethylpiperazinyl; and
An $^{(-)}$ is an anion.

Re. 29,835

1,2,4-TRIAZOLE NUCLEOSIDES

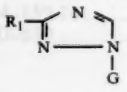
Joseph T. Witkowski, Laguna Niguel, and Roland K. Robins, Santa Ana, both of Calif., assignors to ICN Pharmaceuticals, Irvine, Calif.

Original No. 3,798,209, dated Mar. 19, 1974, Ser. No. 240,252, Mar. 31, 1972. Continuation-in-part of Ser. No. 149,017, Jun. 1, 1971, abandoned. Application for reissue Mar. 28, 1977, Ser. No. 782,294

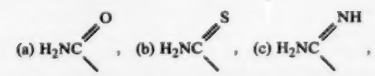
Int. Cl.[2] **C07H** *19/06, 19/10*

U.S. Cl. 536—29 **18 Claims**

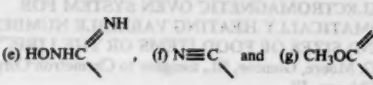
1. A compound of structure



wherein G is [a pentofuranosyl moiety whose 2'-oxygen is trans to the aglycon] *β-D-ribofuranosyl* and R_1 is selected from the group consisting of



(d) physiologically acceptable acid addition salts of (c),



2. A compound selected from the group consisting of 5'-phosphates and 3',5'-cyclic phosphates of a compound according to claim 1.

Re. 29,836

4-HYDROXY-3-(3-ISOXAZOLYLCARBAMOYL)-2H-1,2-BENZOTHIAZINE 1,1-DIOXIDES AND PROCESS FOR THEIR PRODUCTION

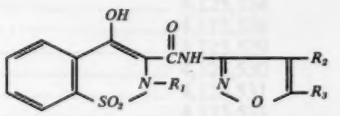
Harold Zinnes, Rockaway; Martin L. Schwartz, Gillette, and John Shavel, Jr., Mendham, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Original No. 3,822,258, dated Jul. 2, 1974, Ser. No. 356,026, Apr. 30, 1973. Continuation-in-part of Ser. No. 333,821, Feb. 20, 1973, Pat. No. 3,816,828, which is a division of Ser. No. 119,967, Mar. 1, 1971, Pat. No. 3,787,324. Application for reissue Oct. 11, 1977, Ser. No. 840,929

Int. Cl.[2] **C07D** *279/02*

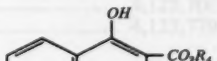
U.S. Cl. 544—49 **2 Claims**

7. A process for the production of a compound of the formula I:



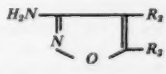
I

wherein R_1 is hydrogen or methyl and R_2 and R_3 are hydrogen or alkyl having 1 to 7 carbon atoms or its corresponding alkali metal, alkaline earth and amine salts; which comprises refluxing together a compound of the formula II:



II

in which R_4 is lower alkyl with a compound of the formula III:



III

in an inert solvent in the presence of a molecular sieve adapted to remove the by-product alcohol formed.

Re. 29,837

ELECTROMAGNETIC OVEN SYSTEM FOR AUTOMATICALLY HEATING VARIABLE NUMBERS AND SIZES OF FOOD ITEMS OR THE LIKE

Donald G. Moore, Glencoe, Ill., assignor to Chemetron Corporation, Chicago, Ill.

Original No. 3,854,022, dated Dec. 10, 1974, Ser. No. 380,187, Jul. 18, 1973. Continuation-in-part of Ser. No. 300,763, Oct. 25, 1972, Pat. No. 3,936,626. Application for reissue Mar. 26, 1976, Ser. No. 670,888

Int. Cl.[2] H05B 9/06

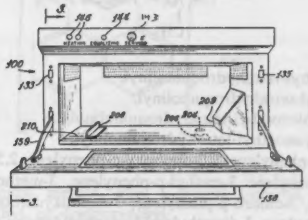
U.S. Cl. 219—10.55 B **43 Claims**

1. A system for heating articles comprising:

a heating structure defining a cavity to which articles to be heated and electromagnetic energy for heating the articles are supplied;

a control unit located outside said cavity for controlling the application of electromagnetic energy thereto; and

a removable sensor coupled to said control unit when positioned at a predetermined location in said cavity and capable of absorbing energy at a rate which is proportional to the rate at which an article to be heated increases in temperature, so that when an article to be heated reaches a predetermined temperature said control unit



terminates the application of electromagnetic energy to said cavity.

PATENTS

GRANTED NOV. 14, 1978

ERRATA

For CLASS	See PATENT NO.
405–066	4,124,981
405–232	4,124,982
405–260	4,124,983
405–293	4,124,984
405–150	4,124,985
405–212	4,124,986
405–276	4,124,987
405–228	4,124,988
405–225	4,124,989
405–167	4,124,990
405–166	4,124,991
072–009	4,125,004
070–279	4,125,008
074–713	4,125,026
422–202	4,125,378
422–269	4,125,379
422–180	4,125,380
422–190	4,125,381
075–125	4,125,399
209–140	4,125,456
521–032	4,125,486
521–137	4,125,487
521–128	4,125,488
521–136	4,125,489
521–051	4,125,490
528–363	4,125,519
528–274	4,125,521
528–061	4,125,522
528–312	4,125,523
528–366	4,125,524
528–388	4,125,526
546–090	4,125,529
546–167	4,125,530
546–133	4,125,531
546–019	4,125,533
562–418	4,125,558
562–531	4,125,559
429–199	4,125,638
429–038	4,125,676
526–048.3	4,125,692
204–159.16	4,125,700
340–630	4,125,779

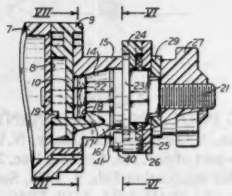
405-066 4,124,983
405-212 4,124,984
405-260 4,124,985
405-293 4,124,986
405-450 4,124,987
405-712 4,124,988
405-776 4,124,989
405-778 4,124,990
405-825 4,124,991
405-167 4,124,992
405-160 4,125,004
072-069 4,125,005
070-270 4,125,006
074-713 4,125,007
422-302 4,125,008
422-264 4,125,009
422-180 4,125,010
422-190 4,125,011
075-125 4,125,012
209-140 4,125,013
221-032 4,125,014
221-122 4,125,015
221-128 4,125,016
221-130 4,125,017
221-021 4,125,018
226-102 4,125,019
226-274 4,125,020
226-061 4,125,021
226-222 4,125,022
226-266 4,125,023
226-088 4,125,024
246-090 4,125,025
246-107 4,125,026
246-122 4,125,027
426-019 4,125,028
242-418 4,125,029
262-221 4,125,030
429-199 4,125,031
429-018 4,125,032
226-048.2 4,125,033
204-139.19 4,125,034
340-030 4,125,035

PATENTS

GRANTED NOVEMBER 14, 1978

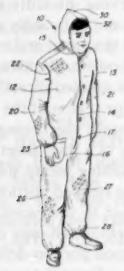
GENERAL AND MECHANICAL

4,124,902
MOUNTING ASSEMBLY CONNECTING A FACE SHIELD TO A SAFETY HAT
Robert J. Seres, Allison Park, and James J. Summers, Bethel Park, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.
Filed Oct. 31, 1977, Ser. No. 847,125
Int. Cl.[2] A41D *13/00*; A44B *21/00*
U.S. Cl. 2—10 **7 Claims**



1. A mounting assembly for supporting a face shield from a safety hat, said assembly comprising a pair of brackets for attachment to the opposite sides of a hat, each of said brackets having a downwardly extending recess therein between its inner and outer sides, a slide disposed in each recess for vertical movement therein, resilient means in said recess normally holding the slide in its upper position, the outer side of each bracket being provided with a passage extending outwardly therethrough from its recess, the lower wall of the passage having an opening therein, a prong projecting outwardly from the slide into said opening and having a projection on top normally extending above said lower wall and forming a shoulder facing but spaced from the slide, a bolt having a head normally locked in said passage between said shoulder and slide, the bolt extending out of the passage, an arm with a hole through one end receiving the bolt, a nut on the outer end of the bolt for holding the arm on the bolt, and means for clamping opposite sides of a face shield to the arms, said bolts being releasable from the brackets when said slides are depressed.

4,124,903
SAFETY GARMENT FOR AUTOMOBILE REPAIRS
Ted G. Shaw, 1201 Hillside Rd., Northbrook, Ill. 60015
Filed Jul. 27, 1977, Ser. No. 819,500
Int. Cl.[2] A41D *13/02*
U.S. Cl. 2—79 **2 Claims**



1. A one-piece multi-purpose garment covering substantially all of the clothing of a wearer and comprising

(a) a vest portion having first and second lateral sides separated by a vertical slit,

(b) fastener means having mating portions arranged along opposite sides of said slit for opening and closure thereof,

(c) first and second sleeves on respective said first and second lateral sides of the vest portion, each of said sleeves defining an arm hole at a proximal extremity thereof and including a permanent connection with an adjacent lateral side of the vest portion generally circumscribing said arm hole, each of said sleeves further defining a hand opening circumscribed by a wrist cuff at a distal extremity thereof,

(d) first and second pant legs joined to respective said first and second lateral sides of the vest portion and depending downwardly therefrom, each of said pant legs defining a foot opening circumscribed by an ankle cuff at a lower extremity thereof, and

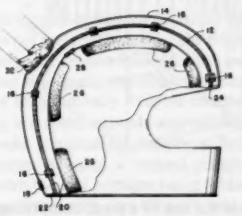
(e) a hood permanently attached to an upper edge of said vest portion, and defining a forwardly facing opening bounded upwardly and laterally by a generally oval marginal edge portion; and wherein

(1) said wrist cuff includes elastic means encircling said hand opening, said ankle cuff includes elastic means encircling said foot opening, and said marginal edge portion of the hood includes elastic means adapted to maintain said hood adjacent the head of a wearer irrespective of adverse wind conditions, each said elastic means comprising a narrow elastic band affixed to and encased within an adjacent inwardly folded edge portion of said garment,

(2) said vest portion, said sleeves, said pant legs, and said hood comprise a rain-repellent fabric impregnated with a dye having a luminescent orange color, and

(3) the fabric of said garment is 70 denier Nylon to facilitate compact folding for storage within an automobile glove compartment.

4,124,904
PROTECTIVE HEAD GEAR
John A. Matthes, Box 144, Rhinecliff Rd., Rhinecliff, N.Y. 12574
Filed Oct. 17, 1977, Ser. No. 842,750
Int. Cl.[2] A42B *3/02*; A63B *71/10*
U.S. Cl. 2—413 **6 Claims**



1. In a protective helmet, a rigid shell adapted to fit over a human head, an outer inflatable liner secured over substantially the entire outer surface of said shell; and an inner inflatable liner secured over substantailly the entire inner surface of said shell and a plurality of spaced foamed sponge-like inserts attached to the inner surface of said inner liner, in which each said liner is fitted with independent check valve inlet means so that each liner may be independently inflated, and maintained in the inflated condition, independently of the other liner.

4,124,905

ARTIFICIAL INTRAOCULAR LENS SYSTEM

James A. Clark, Mendon, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Oct. 29, 1976, Ser. No. 736,908
Int. Cl.[2] A61F *1/16, 1/24*
U.S. Cl. 3—13 **27 Claims**

1. In an artificial intraocular lens system for insertion into the eye including an optical zone and means for supporting the lens in the eye, the improvement comprising at least one pair of anterior and posterior tabs extending from the periphery of the optical zone said tabs being spaced apart a sufficient distance to smoothly receive and channel a portion of the iris therebetween without interfering with the dilation and constriction of said iris, the anterior tab including groove means for receiving and allowing the passage of a pin therethrough, said tabs being adapted to hold the pin substantially perpendicular therebetween, thereby transiridially fixing the lens in the eye.

4,124,906

CHILD'S CRIB FOR USE IN A POOL

Martha F. Millard, Poughkeepsie, and Richard A. Gorges, Hyde Park, both of N.Y., assignors to Raymond Lee Organization, Inc., New York, N.Y.

Filed Nov. 22, 1976, Ser. No. 743,717
Int. Cl.[2] E04H *3/16, 3/19*
U.S. Cl. 4—172 **3 Claims**

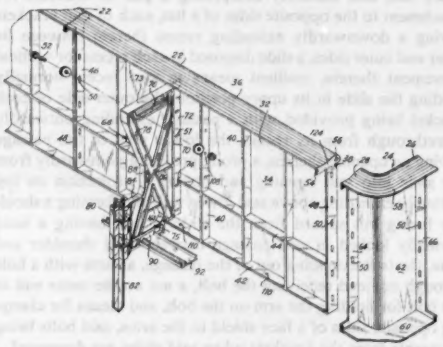
1. A child's crib for use in a pool, comprising:
a crib,
the crib adjustably attachable to a bottom support,
the bottom support positionable in a portion of a pool,
a top of the crib attachable to a coping of the pool,
the bottom support having a roundweighted pad attached to a corner of each of a plurality of bottom support members,
an equal plurality of vertical support members each attached to one of the pads,
the bottom support members forming a plurality of perforations connected to a hollow portion of each bottom support member, whereby the hollow support members may fill with water to reduce buoyancy of the support members,
the crib having an upper rail,
vertical rails attached to the upper rail,
a bottom rail attached to a bottom portion of each of the vertical rails,
a floor attached to a bottom of the bottom rail by a plurality of clamps, and
diagonally opposite edges of the upper rail attached to adjacent sides of the pool coping by an adjustable coping lock attached to each of the opposite upper rail edges.

4,124,907

SWIMMING POOL, AND COMPONENTS THEREOF

Merrill L. Laven, 4 Marion Ave., Albany, N.Y. 12203

Continuation-in-part of Ser. No. 428,882, Dec. 27, 1973, Pat. No. 3,938,199. This application Feb. 9, 1976, Ser. No. 656,595
Int. Cl.[2] E04H *3/16, 3/18;* **E04C** *1/00*
U.S. Cl. 4—172.19 **28 Claims**



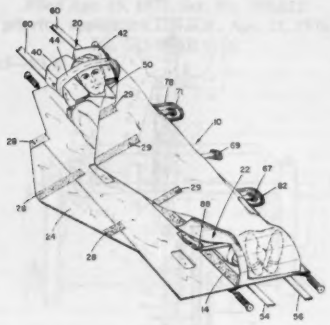
1. In a swimming pool, a panel for forming part of a wall of the pool, said panel being composed in its entirety of a single unit of plastic material, and said panel having a relatively thin upright wall which has an inner surface directed toward the interior of the pool and adapted to be engaged by a plastic liner as well as an outer surface which is directed away from the interior of the pool, said wall extending upwardly from a lower edge of said panel and said wall having at an upper region of said panel a portion curving inwardly toward the interior of the pool then upwardly and outwardly away from the pool to form a coping portion at the upper end region of the panel, and said wall being stepped outwardly away from the pool at an upper region next to but situated directly beneath said coping portion and an upper edge region of the upright portion of the pool wall to define beneath the coping portion a recess for receiving an upper edge of a liner sheet as well as a fastening means therefor, and fastening means joined with the panel at the recess defined by the stepped portion thereof for fastening the upper edge of a liner to the panel, said fastening means being in the form of an elongated strip of the same material as said panel and said stepped portion defining just beneath said coping portion a groove directed toward the interior of said pool, said strip having an upper lip aligned with said groove but spaced from the coping portion so that a part of a liner sheet which is thicker than the remainder thereof may be aligned with said groove and situated behind said lip to be held thereby in a condition assembled with the panel.

4,124,908

RESCUE AND TRANSPORTATION DEVICE

Oliver E. Burns, 11113 Sudith Ave., Fountain Valley, Calif. 92708, and Robert C. Day, 2089 Balmer Dr., Los Angeles, Calif. 90039

Filed Oct. 6, 1977, Ser. No. 839,797
Int. Cl.[2] A61F 13/06, 5/04
U.S. Cl. 5—82 R 10 Claims



1. In a device for the rescue and transportation of a victim, said device comprising:

a flexible outer covering having a central bottom portion for receiving the victim, said bottom portion having a head end and a foot end with longitudinally extending first and second side flaps configured for overlapping relation to generally surround the body of the victim;

foot supporting means on said foot end for restraining the feet of the victim, said foot supporting means including a foot flap having means for securing the free end thereof to said bottom portion;

laterally extending pocket means in said foot flap for receiving generally rigid slat means therein;

head restraining means releasably coupled to said head end for generally fixedly positioning the head of the victim relative to said head end;

a first webbing member formed in a continuous loop having an overall length at least twice the length of said bottom portion, said first webbing member being at least partially secured to the undersurface of said bottom portion, said webbing member being configured for lengthwise encircling of the flexible outer covering with the body therein with the loop ends in generally aligned relation;

first, second and third lateral webbing members at least partially secured to said continuous loop webbing member, said first, second and third lateral webbing members being positioned for laterally encircling said flexible outer covering adjacent the knees, waist and chest area of the victim therein; and

laterally disposed pocket means within said head end for receiving at least one reinforcing slat member, said device substantially immobilizing the body of the victim therein.

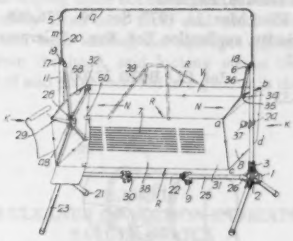
4,124,909

BABIES BED

Mohammad R. M. Saeedy, End of "Rastakhiz" St., Lane No. 20, 5th Door on the left, Shiraz, Iran

Filed Oct. 6, 1977, Ser. No. 839,835
Claims priority, application Iran, Oct. 16, 1976, 19116
Int. Cl.[2] A47D 9/00; A47C 27/08
U.S. Cl. 5—99 B 14 Claims

1. A collapsible cot assembly, comprising an elongated frame member, two coupling hub mechanisms, each hub mechanism including a first part fixedly secured to one end of said frame member and a second part angularly movable with respect to the first part between first and second positions, leg members pivotally connected to each of said movable second parts for movement between stowed positions alongside said elongated frame member and deployed positions extending radially outwardly from said hub mechanisms, and means on



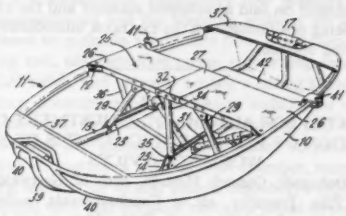
said first fixed parts to hold said leg members in their deployed positions when said second parts are in said first positions and to permit movement toward said stowed positions only when said second parts are in said second positions.

4,124,910

FOLDABLE DINGHIES

Jean-Francois Raymond, London, England, assignor to Vango (Scotland) Limited, Glasgow, Scotland, a part interest

Filed Sep. 23, 1977, Ser. No. 835,870
Int. Cl.[2] B63B 7/00
U.S. Cl. 9—2 C 17 Claims



1. A foldable dinghy comprising a frame and a covering of flexible waterproof material therefor, the frame being foldable both transversely and longitudinally for the purpose of storing and transporting the dinghy, wherein the frame comprises

a plurality of longitudinally foldable members which, when the dinghy is erected, extend longitudinally of the dinghy, each of said longitudinal members having two hinge means therein defining a central portion and two end portions with the end portions being foldable toward each other about transverse axes through said hinge means;

at least one transverse foldable member which, when the dinghy is erected, extends transversely of the dinghy intermediate the ends of the dinghy, and

means for maintaining the dinghy erected,

said means being releasable to allow said at least one foldable transverse member to be folded, thereby drawing the longitudinal members into parallel contiguous relationship along the central longitudinal axis of the dinghy with the axes of said hinge means substantially aligned so that the foldable longitudinal members may be folded longitudinally.

4,124,911

RELEASE DEVICE FOR EMERGENCY SEA RESCUE APPARATUS

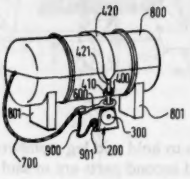
Birgitt I. Wildhagen, Hamburg, Fed. Rep. of Germany, assignor to Dunlop Limited, England

Filed Mar. 11, 1977, Ser. No. 776,668

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1976, 760782

Int. Cl.[2] B63B *23/00*

U.S. Cl. 9—33 **9 Claims**



1. Release device suitable for use with an emergency sea rescue apparatus in which a rescue craft is mounted on a ship and is releasably attached to a water pressure release mechanism which releases said craft when a predetermined water pressure is reached, said device comprising an eye hook releasably attachable to said water pressure release mechanism, a clamping shackle which can be attached to a painter attached to said rescue craft and having an opening which encircles the shaft on said eye hook; an attachment member secured to said ship and having an approximately semicircular bearing surface for said eye hook, whereby the clamping shackle can be movable through any angle between about 0° and 180° in the horizontal and vertical directions relative to the shaft of the eye hook and wherein with downward directed forces the eye hook bears against the approximately semicircular bearing surface so as to be capable of pivoting about a bearing point on said attachment member, said eye hook having a shoulder at its lower end which, with upward directed forces, can bear on a fixed abutment on said attachment member and the clamping shackle being positionable on the eye hook immediately above said bearing surface.

4,124,912

APPARATUS FOR AUTOMATIC ADJUSTMENT OF THE POSITION OF WORKING MECHANISMS OF SHOE WORKING DEVICES

Ludvik Dokoupil; Oldrich Hrouda, both of Gottwaldov, and Josef Zila, Travniky, all of Czechoslovakia, assignors to Zavody presneho strojirenstvi, Gottwaldov, narodni podnik, Gottwaldov, Czechoslovakia

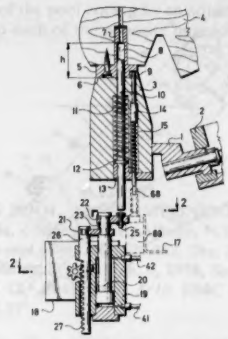
Filed Jul. 13, 1977, Ser. No. 815,433

Claims priority, application Czechoslovakia, Jul. 14, 1976, 4658/76

Int. Cl.[2] A43D *3/00*

U.S. Cl. 12—126 **5 Claims**

1. An arrangement for the automatic adjustment of the position of the working devices of shoe stretching devices of a shoe making machine according to the size numbers of right and left shoe lasts, the shoe last having a heel part and a toe part and a bearing surface for fixing it on a support, the last being provided on its bearing surface with a plate, said plate having a hollow extension with a stepped down opening engaging into the heel part of the last, the depth of such opening determining the size number of the last, the plate being provided with an auxiliary opening in addition to the stepped down opening, identification means with an upper and lower face adapted to be moved to different working positions of the shoe making machine a support for the identification means, a support having two longitudinal and parallel openings, a main identification pin slidably arranged within one of the openings and extending beyond both faces of the support, spring means urging the main identification pin into its lower, retracted position, said main identification pin being positioned coaxial with the stepped down opening within the plate of the last, an auxiliary identification pin within the second opening of the support and extending beyond both faces of the support, spring means urging the auxiliary identification pin into its upper position, a detection unit arranged below both identification pins on a fixed part of the machine, the detection unit having a fixed hydraulic working cylinder with a piston arranged slid-



ingly therein, means to raise the main identification pin until it strikes the bottom of the stepped down opening in the extension of the plate, a first detection means comprising means for detecting the position of the raised identification pin and a second detection means for detecting the position of the auxiliary identification pin, and means responsive to the last-named means for selecting a working device for operating upon a right or a left shoe last.

4,124,913

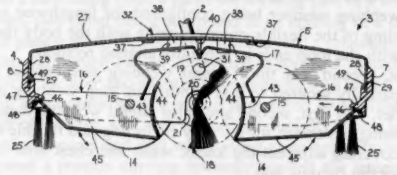
FLOOR SWEEPER WITH UNITARY FRAME

Henry J. Rosendall, Grand Rapids, Mich., assignor to Bissell, Inc., Grand Rapids, Mich.

Filed Jun. 29, 1977, Ser. No. 811,242

Int. Cl.[2] A47L *11/33*

U.S. Cl. 15—42 **19 Claims**



1. In a floor sweeper having a handle and a bail attached to said handle, a lower sweeping unit attached to said bail and comprising:

(a) a unitary frame having a peripheral portion defining the end walls and the front and rear side walls of the lower sweeper unit,

(b) a dust pan assembly including a dust pan pivotally mounted on an axle disposed for shifting movement on said frame, with said axle having sweeper wheels disposed thereon.

(c) a brush roller including a shaft with coupling wheels disposed to be drivingly engaged by said sweeper wheels,

(d) bearing means on said frame end walls for journaling the ends of said brush roller shaft,

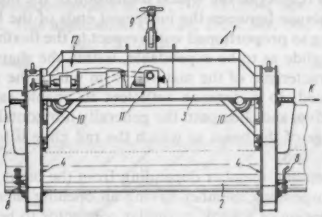
(e) and said frame end walls themselves forming outwardly displaceable spring means for holding said brush roller and its shaft in place.

4,124,914

WORKING TOOL OF A MACHINE FOR CLEANING THE OUTER SURFACE OF PIPES

Vladimir L. Buzhinsky; Konstantin E. Raschepkin; Mikhail G. Dunjushkin; Gennady T. Lysogorsky; Rustem I. Valeev; Yakov A. Nisenbaum, and Deviz F. Ikhsanov, all of Ufa, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky Institut Po Sboru, Podgotovke I Transportu Nefti I Nefteproduktov "Vniisptneft", U.S.S.R.

Filed Apr. 15, 1977, Ser. No. 788,022
Claims priority, application U.S.S.R., Apr. 21, 1976, 2342903
Int. Cl.[2] B08B *9/02*
U.S. Cl. 15—93 R **2 Claims**



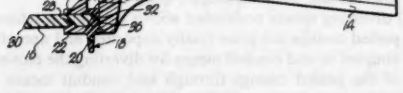
1. Apparatus mountable on a pipeline for cleaning the outer surfaces of a pipeline made of a plurality of pipes welded end-to-end comprising, a self-propelled carriage mountable on a pipeline made of pipes welded end-to-end and having means for travelling axially on the pipeline during cleaning of outer surfaces thereof, at least one hollow annular casing fixed to said carriage for travelling with said carriage axially of said pipeline, said casing comprising members operable to a spaced apart position constituting an open position for accepting the pipeline therebetween when mounting the carriage on the pipeline and when dismounting the carriage and operable to a closed position enclosing the pipeline circumferentially for cleaning, a rotor on the casing travelling circumferentially of the pipeline when the casing is closed, a tool holder on said rotor travelling circumferentially cf the pipeline and having a cleaning tool thereon having a cutting edge for cleaning the outer surface of the pipeline as said rotor transports the tool circumferentially of the pipeline as said carriage travels axially thereof, said toolholder having an integral cam surface disposed for travelling circumferentially of said pipeline with said cutting edge disposed tangentially to the surface of the pipeline and effective for maintaining the cutting edge clear of the welds to avoid damage thereto, and means biasing the toolholder for maintaining the cam surface and cutting edge tangential to the outer surface of the pipeline.

4,124,915

COMBINATION SCRAPER AND SQUEEGEE

Charles W. Schlicher, Wichita, Kans., assignor to S/V Tool Company, Inc., Newton, Kans.

Filed Aug. 15, 1977, Ser. No. 824,658
Int. Cl.[2] A47L *1/06*; B60S *1/02*
U.S. Cl. 15—105 **4 Claims**



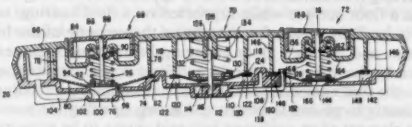
1. A hand tool for cleaning surfaces comprising:
a handle provided with a hollow head having a normally lowermost face;
a rigid plate in said head and extending forwardly therefrom, said plate having a leading scraper edge exteriorly of the head;
a joint within the head fastening the plate thereto; and a squeegee in said head, said squeegee being provided with a flexible wiping blade normal to said plate and extending downwardly from said face, said plate having means within said head locking the squeegee against displacement from the head, said locking means comprising a portion of said plate received in a groove in the squeegee.

4,124,916

VACUUM CLEANER CONDITION INDICATOR AND SAFETY DEVICE

Charles T. Fromknecht, Anderson, S.C., assignor to The Singer Company, Elizabeth, N.J.

Filed Aug. 4, 1977, Ser. No. 821,878
Int. Cl.[2] A47L *9/00*
U.S. Cl. 15—339 **6 Claims**

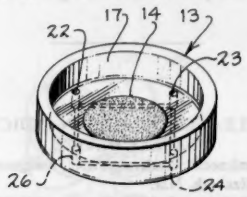


3. In a vacuum having a housing including a suction copartment, an air permeable filter bag mounted in said compartment, means defining an air inlet in said housing communicating with said filter bag, means defining an outlet in said housing, an air-moving unit in flow communication with said compartment and said outlet for drawing dirt-laden air through said inlet and discharging filtered air through the outlet, the improvement comprising: clog detection means for determining the existence of a predetermined excessively low pressure in said suction compartment and for bleeding ambient air into said compartment to maintain a sufficient flow of air through said air-moving unit, said detection means comprising an actuator and a relief valve, said actuator having a casing supported in the housing, pressure responsive means including a movable partition member mounted in and separating said actuator casing into first and second chamber, means communicating said suction compartment with the first chamber, means communicating ambient air to said second chamber, a third chamber associated with said actuator having a portal in communication with the suction compartment, closure means movable with said partition member for normally closing said portal and for opening said portal when the pressure in said suction compartment equals said predetermined pressure, said relief valve having a casing supported in the housing, pressure responsive means including a movable partition member mounted in and separating said valve casing into first and second chambers, means communicating said third chamber of said actuator with the first chamber of said relief valve, means communicating ambient air to the second chamber of said relief valve, the casing of said second chamber of said relief valve having a wall including a bleed hole communicating said second chamber with said suction compartment and normally closed by said partition member, said partition member being movable to open said bleed hole when the pressure in said first chamber of the relief valve equals said predetermined pressure, and means for normally balancing the pressure across said relief valve partition member, whereby upon detection of said low pressure said closure means opens said portal to vent said first chamber of said relief valve of said suction compartment thereby to open said bleed hole to allow ambient air to enter said suction chamber.

4,124,917
LUBRICATABLE FLOOR GLIDE FOR HEAVY APPLIANCES

William O. Gilliland, 10128 Denison Ave., Cupertino, Calif. 95014

Filed Aug. 1, 1977, Ser. No. 820,871
Int. Cl.[2] A47B *91/06*
U.S. Cl. 16—42 R 5 Claims

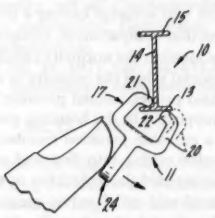


1. A glide shoe for readily receiving one of a plurality of supporting foot elements of a heavy appliance for sliding same across a floor surface while supported on a fluid bearing, said shoe comprising means for supporting thereon one of the foot elements and having a floor engaging bearing surface, means carried by the first named means and forming a cavity disposed above the first named means, the last named means including a sufficiently large and unobstructed access opening for passing a foot element of an appliance into said cavity to be supported upon the bottom of said cavity, said cavity being adapted to receive a deposit of fluid lubricant therein, a plurality of flow passages extending between said cavity and said bearing surface for delivering fluid lubricant from said cavity to the interface defined between the floor surface and said bearing surface to form a fluid bearing therebetween supporting said glide shoe thereon, and grooves formed in said bearing surface interconnecting said flow passages for channeling the liquid therebetween to provide a general distribution of said liquid beneath said bearing surface.

4,124,918
RAIL AND GLIDE ASSEMBLY

David G. Cummings, Ogdensburg, N.Y., assignor to Newell Companies, Inc., Freeport, Ill.

Continuation-in-part of Ser. No. 695,250, Jun. 11, 1976, abandoned. This application Sep. 19, 1977, Ser. No. 834,296
Int. Cl.[2] A47H *15/00*
U.S. Cl. 16—93 D 5 Claims

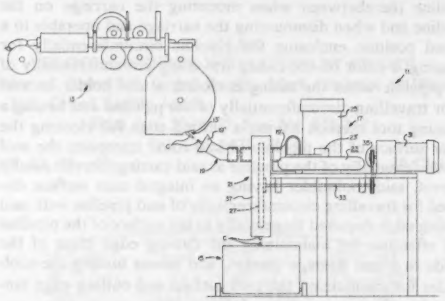


1. A flexible rail glide,
said flexible rail glide being adapted for use with a substantially rigid beam having a generally horizontally oriented flange and a generally vertically oriented web means extending upwardly from a location between the edges of the flange,
said flexible rail glide beam assembleable and disassembleable to said beam from any position between the ends of the beam,
said flexible rail glide being composed of a one-piece, plastic material, and including
a generally U-shaped portion having a pair of arms which extend generally upwardly from a bright position which joins said generally upwardly extending arms,
said pair of arms being spaced from one another near the said bight portion a distance sufficient to provide a small clearance between the inner surfaces of said upwardly extending arms and a generally horizontally oriented flange on a beam with respect to which said rail glide is adapted to be installed,
each of the generally upwardly extending arms having a generally inwardly extending lip portion at the upper end portion thereof,
said lip portions terminating at a position, with respect to the center of the bight portion, which is located inwardly with respect to the widest dimension of the bight portion,
the distance between the innermost ends of the lip portions being so proportioned with respect to the flexibility of said rail glide as to be expandable, within the shape retention characteristic of the material from which the rail glide is formed, to a distance sufficient to enable said arms to receive, and slide past, the generally horizontally oriented flange of the beam to which the rail glide is to be assembled, and
a suspending member depending from the bight portion,
said suspending member having an opening therein for the reception of a hook or similar connector to be associated with the object to be slidably suspended from the glide and, in turn, a beam from which the glide is suspended.

4,124,919
CASING TRANSPORT APPARATUS

Thomas A. Klyce, Memphis, Tenn., assignor to Ranger Tool Company, Inc., Memphis, Tenn.

Filed Jun. 29, 1977, Ser. No. 811,186
Int. Cl.[2] A22C *11/00*
U.S. Cl. 17—1 F 8 Claims



1. Apparatus for transporting frankfurter casings or the like from a station where the casings are peeled from the frankfurters or the like to a station where the peeled casings are to be finally deposited, said apparatus comprising:
(a) a vacuum source for selectively creating a vacuum;
(b) conduit means having a first end operatively communicated with said vacuum source and having a second end positioned adjacent said station where the casings are peeled from the frankfurters for directing said vacuum created by said vacuum source against the peeled casings to pull the peeled casing through said conduit means towards said vacuum source; and
(c) diverting means positioned above the station where the peeled casings are to be finally deposited and operatively coupled to said conduit means for diverting the movement of the peeled casings through said conduit means from said vacuum source to the station where the peeled casings are to be finally deposited, said diverting means including blockage means for blocking passage of the peeled casings through said conduit means, said blockage means having first and second portions for sequential alignment

with said conduit means, said diverting means including means for moving said first and second portions of said blockage means sequentially into and out of alignment with said conduit means.

4,124,920

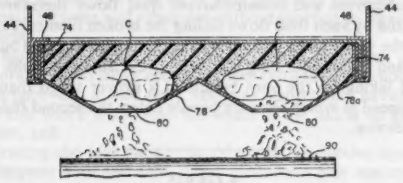
METHOD FOR SEPARATING EDIBLE CRAB MEAT FROM NON-EDIBLE PORTIONS OF COOKED CRABS

Richard T. Wenstrom, Hampton, Va.; Theodore S. Reinke, Rehoboth Beach, Del.; Calvert B. Tolley, Wingate, and J. Clayton Brooks, Cambridge, both of Md., assignors to Sea Savory, Inc., Cambridge, Md.

Division of Ser. No. 643,706, Dec. 23, 1975, Pat. No. 4,003,103, and a continuation-in-part of Ser. No. 457,554, Apr. 3, 1974, abandoned. This application Oct. 29, 1976, Ser. No. 737,088

Int. Cl.[2] A22C *29/00*

U.S. Cl. 17—48 2 Claims



1. The method of removing edible particles of crab meat from the core of a crab body which has been cooked, de-shelled, de-legged and defingered and the body cavity of which has been cleaned out which comprises supporting the sides of an inverted crab core with the body cavity directed downwardly while resiliently pressing downwardly on the uppermost portion of the core, and vibrating the supported core in the range of 1500 to 5000 vibrations per minute to thoroughly remove the edible crab meat from the crab core.

4,124,921

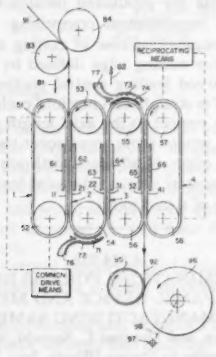
APPARATUS FOR CONSOLIDATING TEXTILE FIBROUS WEBS BY RUBBING IN A CONDENSER

Hans Kaiser, Waldshut, Fed. Rep. of Germany, assignor to Hanseatischer Maschinenbau GmbH, Hamburg, Fed. Rep. of Germany

Filed Apr. 25, 1977, Ser. No. 790,268

Int. Cl.[2] D01H *5/20*

U.S. Cl. 19—153 3 Claims



1. Apparatus for consolidating fibrous webs, comprising

a rubbing gear assembly provided with at least four endless belts and drive means for imparting to each of the belts a circulatory motion in longitudinal direction and a reciprocatory motion in direction normal to the longitudinal direction, so that in use one run of the first belt cooperates with one run of the second belt for the first stage, another run of the second belt cooperates with one run of the third belt for the second stage and another run of the third belt cooperates with one run of the fourth belt for the third stage, the runs of each cooperating pair of runs extending parallel and closely adjacent to each other and moving at substantially the same speed in the same longitudinal direction but in respectively opposite sence in the reciprocatory direction;

said belts being arranged and adapted to convey a fibrous web therebetween in a continuous path successively through said first, second and third stages, while consolidating said web by rubbing in each of said stages, with said web travelling in a first direction in said first and third stages and in a second, opposite direction in said second stage;

belt rollers about which the respective belts are trained;

cover members loosely mounted adjacent to the respective second and third belts between one and the other run thereof in the region of the respective rollers;

web deflecting members extending radially outwardly of each cover member to form a channel therewith for guiding the fibrous web at both sides between the first and second stages and between the second and third stages, respectively; and

orifice means in at least one of said channels for introducing a stream of air into said at least one channel in a direction substantially tangential to the respectively adjacent belt roller.

4,124,922

RETAINING MEANS

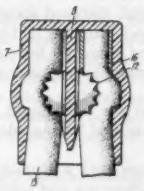
Robert Speedie, Frankston, Australia, assignor to W. A. Deutsher Pty Ltd., Moorabbin, Australia

Filed May 25, 1977, Ser. No. 800,375

Claims priority, application Australia, Jun. 1, 1976, PC6127

Int. Cl.[2] F16G *11/04*

U.S. Cl. 24—115 R 7 Claims



1. A retaining means including a hollow generally rectangular box-like main housing, a cooperating insert member and a retaining strap, said housing including a top, a base, and side wall members and at least one first end wall, an opposite second end wall having a substantial portion thereof open to provide a first aperture communicating axially along the longitudinal axis of said housing with the interior of said housing, said housing being substantially oblong in cross section, said base member including a centrally disposed second aperture, a rib-like internal partitioning means integral with said top and extending axially throughout a substantial portion of the longitudinal axial extent of said housing, said partitioning means extending normally between said top and said base and overlying said second aperture to define two axially extending chambers opening through said first aperture, said retaining strap having two free ends complementary to and acceptable within said chambers by passage through said first aperture to define a closed loop externally of said main housing, said cooperating insert member including a stud having a flat head member and a co-axially disposed cylindrically shaped shank member extending therefrom, and said shank being bifurcated by a slot extending through said shank to form two segments acceptable

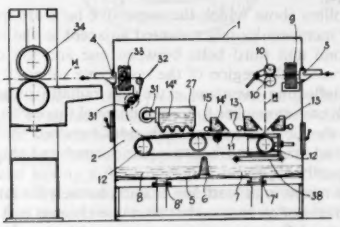
within said second aperture and with the partitioning means acceptable within said slot whereby said stud forces the free ends of said strap against the interior surface of said side wall members to thereby capture said retaining strap against removal from said retaining means.

4,124,923

APPARATUS FOR TEXTURING YARN AND TEXTILE FABRIC CONTAINING SYNTHETIC FIBERS

Enrico Barbieri, Brescia, Italy, assignor to Advanced Textiles Exploitation AG, Vaduz, Liechtenstein

Filed Aug. 3, 1977, Ser. No. 821,519
Claims priority, application Italy, Sep. 3, 1976, 5202 A/76
Int. Cl.[2] D02G *1/00*; D06B *1/06, 9/00*
U.S. Cl. 26—18.5 **12 Claims**



1. Apparatus for texturizing yarn and textile fabrics containing thermo-sensitive synthetic fibers, comprising:
(a) a treating chamber having inlet and outlet ports therein for the material to be treated;
(b) first condensing means near said inlet port for condensing vapors generated in said chamber;
(c) at least one first pair of rollers near said first condensing means for guiding said material;
(d) an endless belt conveyor in said chamber for supporting and conveying said material in said chamber;
(e) at least one first container for a hot liquid vehicle for treating said material, disposed above said belt conveyor and having inlet and outlet for said vehicle;
(f) at least one second container for cold liquid vehicle for free-cooling said material and having inlet and outlet for said vehicle;
(g) a third container for cold liquid vehicle for cooling further said material and having inlet and outlet for said vehicle;
(h) a bottom container with a plurality of drain ports for collecting and discharging said vehicle discharged from said first, second and third containers;
(i) at least one second roller means for transporting said material from said belt conveyor to said outlet port of said chamber; and
(j) a second condensing means near said second pair of rollers and said outlet port of said chamber for preventing vapors from exiting therefrom.

4,124,924

PROCESS FOR MAKING SLUB YARN FROM CONTINUOUS FILAMENT YARN

Bobby M. Phillips, Kingsport, and Charles E. Manning, Elizabethton, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 31, 1977, Ser. No. 829,391
Int. Cl.[2] D02G *1/16, 3/34*
U.S. Cl. 28—220 **5 Claims**

1. Method for making a slub yarn, the method comprising:
(a) feeding a yarn bundle of individual continuous filaments from a source of supply to and through a first fluid jet device having cocurrent and countercurrent fluid flows therethrough and thereby randomly breaking some of the individual filaments at random intervals along the length of the yarn bundle,
(b) maintaining at the same time a drafting force on the yarn bundle sufficient to prevent the broken filaments from entangling with the yarn bundle and to enhance filament breaking, the drafting force being exerted under ambient temperature conditions between two moving surfaces, the linear speeds of which are adjusted such that the drafting force is no more than 1.2 grams per denier;

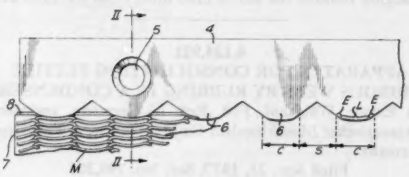
(c) passing the yarn bundle with the nonentangled broken filaments to and through a second fluid jet device having cocurrent and countercurrent fluid flows therethrough and by such fluid flows sliding the broken filaments along the yarn bundle and entangling them with the yarn bundle and thereby forming the broken filaments into slubs; and
(d) taking up the yarn bundle at a slower speed than the speed at which the yarn bundle enters the second fluid jet device.

4,124,925

EXPANDED METAL

Frank Barnett, Hartlepool, England, assignor to The Expanded Metal Company Limited, England

Filed Jun. 7, 1976, Ser. No. 693,533
Claims priority, application United Kingdom, Jun. 5, 1975, 24277/75
Int. Cl.[2] B26D *1/08, 3/08*; B21D *28/14, 31/04*
U.S. Cl. 29—6.2 **4 Claims**



1. In an expanded metal machine of the type incorporating a reciprocatory knife for producing parallel strand expanded metal mesh, the improvement comprising: a reciprocatory knife having a longitudinal row of cutting teeth, each tooth having an effective cutting edge defined by a longitudinally and convexly curved leading central portion terminating at both ends thereof in straight end portions each inclined sharply backwardly with respect to the axial length of the knife, and each tooth being spaced from an adjacent tooth such that the effective cutting edges of adjacent teeth are spaced apart an axial distance almost as great as the axial length of said effective cutting edge of a said tooth.

4,124,926

EDGE TERMINATIONS FOR GAS DISCHARGE DISPLAY PANEL DEVICE AND METHOD OF MANUFACTURING SAME

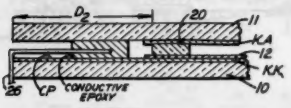
George A. Kupsky, and Douglas L. Santchi, both of State College, Pa., assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 642,512, Dec. 19, 1975, Pat. No. 4,039,882.
This application Feb. 18, 1977, Ser. No. 770,253
Int. Cl.[2] H01J *9/32, 9/36*
U.S. Cl. 29—25.13 **2 Claims**

1. In a method of making a gas discharge display panel

constituted by (A) providing a pair of electrode carrying glass substrates joined in spaced apart relation by a seal to form (1) a thin gas discharge chamber, and (2) at least one notch between said substrates along an edge of the panel, and terminal pads constituted by printed circuit elements electrically connected to electrodes through said seal, and (B) permanently electrically connecting electrodes on one substrate to the terminal pads on the opposite substrate by a silver conductive epoxy, the improvement comprising the steps of

(1) extruding a curable liquid silver conductive epoxy ele-



ment in said notch at all of said pads, and bridging the space between said substrates without shorting to adjacent pads,

(2) immersing a solid metal conductive pin into each said curable liquid silver epoxy element extruded in the notch, respectively, at said pads, said pins respectively having a width which is less than the width of the pad at its location, and

(3) curing the said curable liquid silver conductive epoxy elements with said solid metal conductive pins immersed therein.

4,124,927

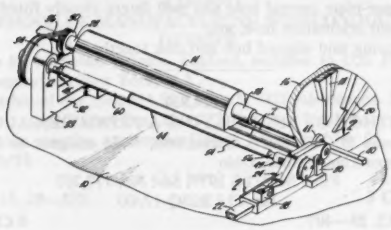
AUTOMATIC LATHE WITH ROTARY CUTTER

Jess F. Sorenson, 12393 Overcrest Dr., Yucaipa, Calif. 92399

Continuation of Ser. No. 457,918, Apr. 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 237,487, Mar. 23, 1972, Pat. No. 3,827,318. This application Oct. 29, 1976, Ser. No. 736,972

Int. Cl.[2] **B23P** *23/02;* **B23Q** *39/02;* **B23B** *5/44*

U.S. Cl. 29—37 A **15 Claims**



1. A lathe comprising:

a base;

sliding headstock means mounted on said base for reciprocating movement longitudinally of the base;

collet means on said headstock for gripping a workpiece;

first drive means reciprocating with said headstock for rotating said collet and workpiece in a first direction;

a vertical support mounted on said base forward of the sliding headstock;

a bushing in said vertical support in axial alignment with said collet for supporting the rotating workpiece forward of the collet;

feed means for recipriocating said headstock to advance said rotating workpiece through said bushing;

a plurality of tools mounted adjacent the forward face of said vertical support above the workpiece, each said tool being selectively engageable with the rotating workpiece;

a rotatable cutting tool mounted adjacent said bushing adjacent the forward face of said vertical support by mounting means permitting selective reciprocation of said rotatable tool toward and away from said workpiece, said rotating tool being located on the side of the workpiece which is moving upward as the workpiece rotates;

a first gear coaxial with said rotatable cutting tool and fixed thereto for rotation therewith, said first gear being slightly smaller in diameter than the cutting tool;

second and third gears disposed outwardly from said first gear and forming a drive train for driving said first gear;

second drive means disposed outwardly from said first drive means;

means operatively connecting said first and second drive means for reciprocation together and rotation together in the same direction; and

an extensible shaft connecting said second drive means to said third gear for rotating said rotatable tool in said first direction at precisely an integer ratio relative to the rate of rotation of said workpiece and for permitting reciprocation of said second drive means axially relative to said third gear.

12. A lathe comprising:

a base;

headstock means mounted on said base for reciprocating movement longitudinally on the base;

collet means on said headstock for gripping a workpiece;

drive means reciprocating with said headstock for rotating said collet and workpiece;

a rotatable cutting tool mounted on said base;

feed means for reciprocating said headstock means to advance said workpiece adjacent said tool as said workpiece rotates;

a connecting rod having one end connected to said tool;

means attached between the other end of said connecting rod and said drive means for rotating said tool at precisely an integer ratio relative to the rate of rotation of said rod while accommodating reciprocation of said drive means relative to said cutting tool;

a pulley means attached to one end of said tool adjacent the said drive means and fixed against lateral movement relative to said headstock;

belt means operatively connecting said drive means and said pulley means;

holder means rotatably mounting said cutting tool, and mounted for lateral movement on said base perpendicular to the collet axis for advancing and retracting the cutting tool, said holder means attached to the other end of said connecting rod to rotate said cutting tool;

a cutting tool gear mounted in said holder means;

a cutting gear shaft rotatably responsive to said cutting tool gear;

a gear sleeve mounted on said cutting gear shaft, adjacent one side of said cutting tool gear;

a locking cap mounted on said cutting gear shaft adjacent the other side of said cutting tool gear; and

an output bearing cylindrically mounted on said gear sleeve and said locking cap adjacent said cutting tool gear, said output bearing having a diameter greater than the outside diameter of said cutting tool gear.

4,124,928

PROPELLER SHAFT LINER AND INSERTING APPARATUS

Martin H. Stark, 109 N. Wheeler, Saginaw, Mich. 48602

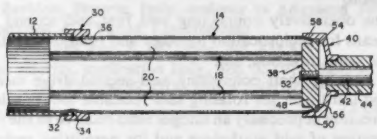
Division of Ser. No. 544,236, Jan. 27, 1975, Pat. No. 4,014,184. This application Jan. 27, 1977, Ser. No. 763,170

Int. Cl.[2] **B23P** *11/02;* **B25B** *27/06*

U.S. Cl. 29—235 **2 Claims**

1. Apparatus for inserting a radially resiliently compressible tubular liner into a hollow cylindrical shaft having an inside diameter less than the normal uncompressed outer diameter of the tubular liner, said apparatus comprising a sizing ring having a tubular liner-passing opening therethrough tapering from a minimum diameter equal to or less than the inside diameter of said shaft to a maximum diameter equal to or greater than said

normal outer diameter of said tubular liner, means for seating said ring on one end of said shaft, pusher means including a disc-like pusher member axially engageable with one end of said tubular liner and having an outer diameter less than said minimum diameter of said ring and less than the normal inner diameter of said liner, an annular guide member having an opening in one end thereof adapted to receive said pusher member in axially seated engagement within said opening,



annular surfaces on said guide member and said pusher member cooperable when said pusher member is seated within said opening to define an annular groove adapted to receive one end of said tubular liner, the radially outer wall of said groove tapering from a maximum diameter at the mouth of the groove which is slightly greater than the normal outer diameter of said liner to a minimum diameter approximately equal to the outer diameter of said pusher whereby said one end of said liner is radially compressed when received in said groove.

4,124,929

EXTRACTOR FOR WATCH PUSH BUTTONS

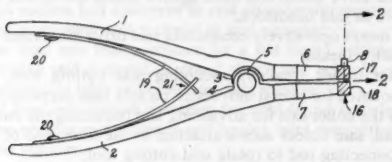
Jean Roux, Clos a Bec, La Sagne, Switzerland (2314)

Filed Jun. 29, 1977, Ser. No. 811,202

Claims priority, application Switzerland, Jun. 28, 1976, 7992/76

Int. Cl.[2] B23P *19/04*

U.S. Cl. 29—268 **8 Claims**



1. An extractor tool for extracting watch push buttons having a sleeve and delicate central portions such as stems and switch components, said tool comprising

a pair of levers each including

a handle portion, and

a forward extension,

hinge means including a hinge intermediate said levers for separating said forward extensions when said handles are moved together,

a first of said forward extensions having a stud mounted thereon on an axis generally perpendicular to the longitudinal axis of the tool,

said stud having a pressing surface for engaging a push button,

said pressing surface including a central recessed portion for freely receiving said delicate, central portions of said push button and a peripheral shoulder for engaging the sleeve of the push button,

a shielding cushion surrounding the stud to protect a watch case with which the tool is used to extract a push button, and

the other of said forward extensions having a cushioned abutment end opposite the stud and positioned to bear against a portion of the watch case directly opposite the push button when said stud is positioned against the push button.

4,124,930

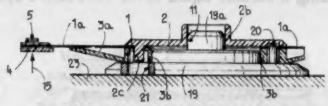
METHOD FOR MANUFACTURING A CHARACTERS CARRYING AGGREGATE FOR PRINTING MACHINE

Eric Bauer, Neuchatel, Switzerland, assignor to Caracteres S.A., Neuchatel, Switzerland

Filed Mar. 14, 1977, Ser. No. 776,951

Int. Cl.[2] B23Q *17/00*

U.S. Cl. 29—407 **4 Claims**



1. A method of manufacturing a characters carrying aggregate for printing machines on a universal base-plate having one of a central protrusion or central hole, at least two upstanding positioning pins and an orientation finger, said aggregate including a disk provided with resilient radial arms adapted to have said characters at their end and a central hub, said method comprising:

forming said disk with a central hole, at least two positioning holes corresponding to the spacing of said base-plate pins, and an orientation aperture corresponding to the alignment of said base-plate positioning finger of a size greater than the size of said finger;

forming said hub with one of a central hole adapted to fit over said base-plate protrusion or a central protrusion adapted to fit in said base-plate hole, and an orientation hole corresponding to the alignment of said base-plate positioning finger of a size equal to or slightly less than the size of said finger;

mounting said disk on said base-plate with said positioning pins engaged in said positioning holes and said finger freely passing through said orientation aperture;

mounting said hub over said disk on said base-plate with one of said central hole mounted on said base-plate central protrusion or said central protrusion mounted in said base-plate central hole and said finger closely fitted into said orientation hole; and

securing said aligned hub and disk together.

4,124,931

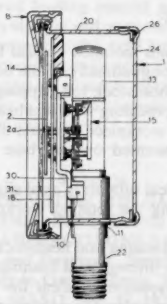
METHOD OF ASSEMBLYING A PRESSURE GAUGE

Raymond D. Miele, Jr., Springfield, N.J., assignor to Eltra Corporation, Toledo, Ohio

Filed Mar. 14, 1977, Ser. No. 777,207

Int. Cl.[2] B23Q *17/00*

U.S. Cl. 29—407 **4 Claims**



1. A method of assembly for a pressure gauge including a case and a gauge movement, comprising the steps of:

mounting the gauge movement on a plate,

inserting said plate and mounted gauge movement into the case, and

fastening said plate to the wall of said case with fasteners that pass through the wall and enter a portion of said plate.

4,124,932

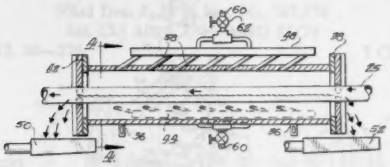
PREQUENCH COOLING FOR GALVANIZED TUBING

Arthur H. Rogove, Cinnaminson, N.J., and Augusto H. Hijuelos, New Lenox, Ill., assignors to Allied Tube & Conduit Corporation, Harvey, Ill.

Filed Sep. 1, 1977, Ser. No. 829,667

Int. Cl.[2] B23P *17/00*

U.S. Cl. 29—527.4 **10 Claims**



1. A method for galvanizing a continuous length of steel tubing be continuously supply steel strip, roll-forming said strip into tubular shape, welding a seam along said rolled strip and applying a zinc coating to said welded strip in a galvanizing bath as said tubing moves continuously horizontally therethrough, wherein the improvement comprises

subjecting at least about the bottom half of said coated tubing without completely submerging said tubing to a prequench flow of liquid coolant very shortly after its exit from said galvanizing bath, said prequenching being carried out by flowing a coolant stream in the direction of movement of said tubing to superficially harden said zinc coating, and

then cooling said prequenched coating by immersion in a coolant bath.

4,124,933

METHODS OF MANUFACTURING SEMICONDUCTOR DEVICES

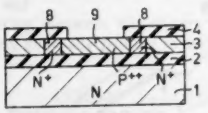
Keith H. Nicholas, Reigate, England, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 574,510, May 5, 1975, abandoned. This application Jan. 21, 1977, Ser. No. 761,369

Claims priority, application United Kingdom, May 21, 1974, 22583/74

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—578 **3 Claims**



1. A method of manufacturing a semiconductor device comprising a low resistivity conductive region having a substantially uniform narrow line width, said method comprising the steps of: (a) providing a semiconductor element having an insulating layer disposed at at least a surface part thereof, (b) depositing a layer of relatively high resistivity polycrystalline semiconductor material on said insulating layer, (c) forming a masking layer on a part of the exposed surface of said polycrystalline layer, said masking layer defining an opening via which said polycrystalline semiconductor layer is partly exposed, (d) diffusing via said opening in said mask, a first conductivity type doping element laterally into a portion of said polycrystalline layer underlying an edge portion of said masking layer, (e) subsequently diffusing via said opening a second opposite conductivity type doping element in a higher concentration but to a lesser distance laterally in said polycrystalline layer, both such diffusing steps being executed in the substantial absence of diffusing the element through said insulating layer itself into the semiconductor element, whereby there is formed between said first and second diffused parts a p,n junction extending substantially in the direction of thickness of the layer, and (f) subsequent to the diffusion process removing said masking layer and subjecting said polycrystalline layer to an etching treatment to selectively remove the outermost diffused region of said opposite conductivity type and the undiffused portions of said polycrystalline layer, thereby leaving adjacent said edge of said polycrystalline layer a relatively low resistivity diffused strip portion that is of said one conductivity type and of substantially uniform width.

4,124,934

MANUFACTURE OF SEMICONDUCTOR DEVICES IN WHICH A DOPING IMPURITY IS DIFFUSED FROM A POLYCRYSTALLINE SEMICONDUCTOR LAYER INTO AN UNDERLYING MONOCRYSTALLINE SEMICONDUCTOR MATERIAL, AND SEMICONDUCTOR DEVICES THUS MANUFACTURED

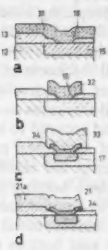
Michel De Brébisson, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 1, 1977, Ser. No. 764,591

Claims priority, application France, Feb. 4, 1976, 76 03093

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—590 **25 Claims**



1. A method of manufacturing a semiconductor device, comprising the steps of:

(a) providing a semiconductor body comprising a major surface and a monocrystalline semiconductor material located at said major surface,

(b) providing a protective insulating layer on said monocrystalline material, said insulating layer having therein at least one window which gives access to said monocrystalline semiconductor material,

(c) depositing at said major surface a layer of polycrystalline semiconductor material which comprises a doping impurity,

(d) diffusing said doping impurity from said polycrystalline layer located at the area of said at least one window into said monocrystalline semiconductor material so that there is formed in said monocrystalline semiconductor material at least one semiconductor zone doped with said diffused impurity,

(e) reducing the thickness of said doped polycrystalline semiconductor layer located in said window after the diffusion process and prior to providing a metal layer of an ohmic contact, and

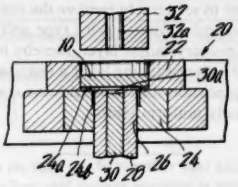
(f) providing said at least one semiconductor zone with an ohmic contact comprising a metal layer which is provided on said reduced polycrystalline material in said window.

4,124,935

METHOD FOR MANUFACTURING A BASE OF A PRESSURE MOUNT TYPE SEMICONDUCTOR DEVICE

Yoshio Sato, No. 23-15, 3-chome, Zenpukuji, Suginami-ku, Tokyo, Japan

Filed Nov. 22, 1976, Ser. No. 744,037
Claims priority, application Japan, Dec. 11, 1975, 50-146918
Int. Cl.[2] H01R 9/00, 43/00
U.S. Cl. 29—630 R 5 Claims



1. A method for manufacturing a base of a pressure mount type semiconductor device which has a base body of electrically and thermally conductive material and a vertically extending cylindrical wall integral with the top of said base body at the middle portion thereof and adapted to engage a pellet pressurizing member therewithin so that said pellet pressurizing member is restrained against upward movement, said base body further having an integral annular projection of weldable material around said cylinderal wall which is used to projection weld a shell to the upper surface of said base to cover a semiconductor pellet within the cylindrical wall, and a stud on the bottom of said base body to be threaded later, said method comprising the steps of preparing a metal blank having a lower metal layer of electrically and thermally conductive and extrudable metal material having a relatively large thickness as compared to the overall thickness of the blank and an upper and annular metal layer of extrudable copper-nickel alloy having a relatively small thickness as compared to the overall thickness of the blank and secured to said lower metal layer on the upper surface thereof, said lower metal layer being exposed through said upper layer at the middle portion of said blank; placing said blank in a blank holding first cavity in an extruder die assembly which has an annular recess in the bottom surface therein with said upper annular metal layer of extrudable copper-nickel alloy against said bottom surface, said first cavity having a second cavity in the central portion of the bottom thereof with an enlarged portion around the end thereof opening into said first cavity and a knockout pin extending into said second cavity from the end of the die assembly opposite from said first cavity, and while holding the knockout pin in said second cavity, driving a punch having a stud forming bore therein into said first cavity from the open end thereof for extruding the material of said lower metal layer into said stud forming bore for forming a stud and extruding the material of said annular metal layer of copper-nickel alloys into the annular recess to form said integral annular projection and extruding the material of the lower metal layer into the enlarged portion of said second cavity around said knockout pin to form said cylindrical wall, whereby said annular projection, said cylindrical wall and said stud are simultaneously formed from said metal blank.

4,124,936

HALL EFFECT IGNITION SYSTEM HOUSING AND METHOD

Roy H. Jellissen, River Grove, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 25, 1977, Ser. No. 790,788
Int. Cl.[2] F02P 3/00
U.S. Cl. 29—602 R 3 Claims

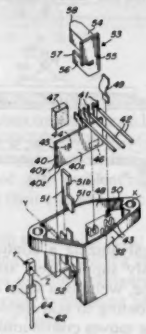
1. A method for assembling a magnetic circuit and a circuit board in an automotive ignition distributor system having a swing arm, said circuit interruptable by a high permeability vane moving through an air gap in said magnetic circuit, said circuit board having a Hall effect sensor attached thereto, said method comprising the steps of:

inserting the circuit board in a housing;

holding the circuit board in a reference position in the housing;

inserting a flux concentrator into a receiving portion of said housing on one side of said circuit board;

attaching a gapping gauge having magnetizable portions to a magnet and pole piece assembly;



inserting said gapping gauge and said magnet pole piece assembly into another receiving portion of said housing on the opposite side of said circuit board so that the circuit board is positioned between said gapping gauge and said flux concentrator with flux passing through the Hall effect sensor located on said circuit board, said flux drawing the flux concentrator toward the circuit board and the magnet and pole piece assembly;

fixing the magnet and pole piece assembly, the concentrator, and the circuit board to the housing; and

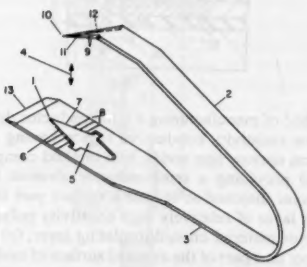
removing the gapping gauge to provide a predetermined air gap between the circuit board and the magnet and pole piece assembly for passage of the moving vane.

4,124,937

IMPROVED NOTCHING SHEAR FOR NOTCHING WOVEN TEXTILE FABRIC OR OTHER FLEXIBLE OR PLIABLE SHEET MATERIAL

Orvis O. Gaughf, Jr., 14216 Chesterfield Rd., Rockville, Md. 20853

Filed Jan. 17, 1977, Ser. No. 760,175
Int. Cl.[2] B26B 13/00
U.S. Cl. 30—229 2 Claims



1. A hand operated notch cutting tool comprising an upper element and a lower element, said upper and lower elements being movable relative to each other, said lower element having an aperture therein, said aperture being defined in part by

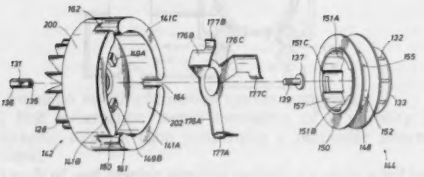
beveled cutting edges, said edges extending rearwardly from an apex to define a triangular notch shape in part, the upper element having a triangular shaped portion with some of the edges thereof being beveled to form upper cutting edges wherein upon relative movement therebetween, the upper cutting edges coact with the lower cutting edges to sever a triangular piece of material therebetween, the severing beginning at the apex and extending rearwardly to notch material placed between the upper and lower elements.

4,124,938

FLEXIBLE STRING CUTTING DEVICE

George C. Ballas, Sr., Houston, Tex., assignor to Weed Eater, Inc., Houston, Tex.

Filed Dec. 3, 1976, Ser. No. 747,378
Int. Cl.[2] A01G *3/06*; A01D *35/26*
U.S. Cl. 30—276 **7 Claims**



1. Apparatus for cutting vegetation and like, comprising:
disc-like head means rotatable about a rotational axis in a cutting plane and having a concentrically located storage portion for spool means and a peripherally located support wall portion having curvilinear bearing surfaces and an odd number of at least three peripheral apertures spaced at equal angular displacements on said head means and said head means having a distributed mass symetrically disposed about the rotational axis,
driving means for rotating said head means in said cutting plane.
a flexible non-metallic line member having a coiled portion in said storage portion of said head means and further having an uncoiled portion extending from said coiled portion into said cutting plane to and through one of said peripheral apertures and further continuing radially outward from the periphery of said head means,
circular spool means insertable axially against an abutment surface in said storage portion of said head means and holding said coiled portion of said line member,
metallic bearing elements including portions in abutting relationship to the curvilinear bearing surfaces of each of said peripheral apertures,
locking means for releasably securing said spool means within said head means against unintended axial and radial displacements, and
said metallic bearing elements are unitary and include a section extending generally parallel to said cutting plane.

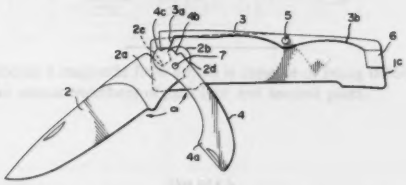
4,124,939

FOLDING KNIVES

Takuo Onoue, 12-14-335, Oike 1-Chome, Ibaragi-shi, Osaka-fu, Japan

Filed Jul. 21, 1977, Ser. No. 817,619
Int. Cl.[2] B26B *1/04*
U.S. Cl. 30—161 **4 Claims**

1. A folding knife, comprising:
an elongate handle having a back, having an elongate longitudinal recess opening opposite the back, and having a pivot pin extending transversely through an end portion of the recess;
a blade, having a tang pivoted on the pivot pin for permitting manual folding of the blade out of and back into the recess, the handle having a resilient lock bar disposed at the back and which has, at an end of the lock bar adjacent the pivot pin, a tooth projecting into the recess, the tang of the blade having a notch disposed opposite the tooth and so shaped that the tooth fixes the blade against folding back into the recess when the blade has been entirely folded out therefrom; and
a blade-releasing lever, having an end pivoted to the pin for permitting manual folding of the lever between an inner position, in the recess, and an outer position, folded out therefrom, the releasing lever having thumb contact means remote from its pivoted end for the manual folding of the lever into the outer position, and having a curved projection on its pivoted end, resiliently engaged with the



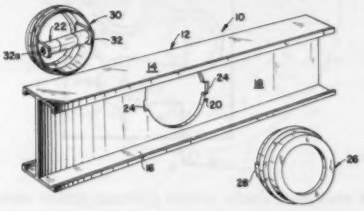
lock bar's tooth for removing the tooth from the notch of the blade's tang and for thereby releasing the blade for the manual folding thereof into the recess of the handle when the blade and the releasing lever are folded out of the handle's recess;
so that in use, the blade releasing lever can be manually folded out conveniently into its outer position by engaging the thumb contact means with the thumb of the user's hand holding the handle, and the lever is automatically folded back into its inner position upon the releasing and the manual folding back of the blade, by the lock bar's tooth resiliently engaged with the release lever's curved projection.

4,124,940

LEVEL AND METHOD OF ASSEMBLING SAME

Peter P. Vaida, 17 Fairview Ave., Clinton, N.J. 08809

Filed Sep. 23, 1977, Ser. No. 835,916
Int. Cl.[2] G01C *9/28*
U.S. Cl. 33—379 **6 Claims**



1. A measuring tool comprising:
a frame including a planar web section having an a circular opening formed therein for receiving a level vial,
a first cover member disposed on one side of said planar web section to cover one side of said opening, said planar web section and said first cover member including cooperating means which cooperate to prevent rotary movement of said first cover member relative to said frame,
a second cover member disposed on the other side of said planar web section to cover the other side of said opening, and including means for retaining a vial in a fixed orientation relative to said second cover member and for disposing said vial within said opening,
a vial supported by said vial-retaining means and being disposed within said opening,

means formed on said first and second cover members for matingly engaging each other through said opening so that during assembly, relative rotary movement is allowed between said first and second cover members to adjust the position of said vial within said opening, and

said first and second cover members being adhered quickly to each other after the adjustment of the position of the vial with respect to said frame to prevent movement of said cover members and vial relative to said frame after adjustment.

4,124,941

PROCESS AND ADDITIONAL DEVICES OF CYLINDER DRYING MACHINES FOR THE UNIFORM DRYING OF TEXTILES

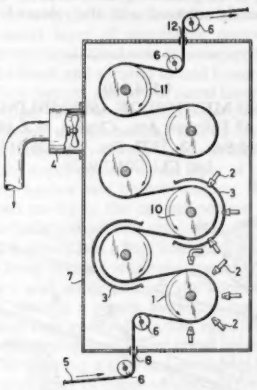
Walter Birke; Hans-Ulrich von der Eltz, and Franz Schön, all of Frankfurt am Main, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 10, 1976, Ser. No. 722,138

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1975, 2540851

Int. Cl.[2] F26B *3/18*

U.S. Cl. 34—18 **10 Claims**



1. A method for controlling migration of a treating agent in drying a moist textile in a cylinder drying machine, said drying machine having a heated drying cylinder and said textile being in the form of a structured fiber web being made of a synthetic fiber or a blend of synthetic and natural fiber and being impregnated with the treating agent that remains permanently in the web after drying, said method comprising the steps of continuously passing the web over the heated drying cylinder said drying cylinder being heated to a temperature high enough to cause the formation of a vapor layer on the surface of the web opposite the surface of the web in contact with the heated drying cylinder and simultaneously removing the vapor layer at a rate which varies with the fiber and structure of the textile web to ensure controlled levels of migration of the treating agent.

4,124,942

METHOD AND APPARATUS FOR CONTROLLING THE MOISTURE CONTENT OF A WEB OF SHEET MATERIAL

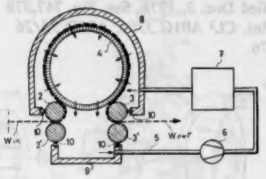
Per-Erik Ohls, 42220 Kaipola, Finland, and Mauri Soininen, Naantali, Finland, assignors to Valmet Oy and Per-Erik Ohls, both of, Finland, part interest to each

Filed Apr. 8, 1976, Ser. No. 674,908

Claims priority, application Finland, Apr. 9, 1975, 751075; Jan. 23, 1976, 760162

Int. Cl.[2] F26B *13/16*

U.S. Cl. 34—115 **11 Claims**

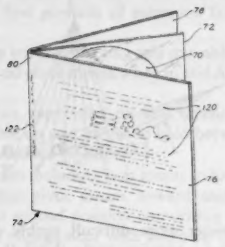


1. Apparatus for providing a web of sheet material, particularly a paper web, which has been dried so as to be within the hygroscopic range, with a desired moisture content which is substantially uniform throughout the entire web, comprising enclosure means having a hollow interior for providing at said hollow interior a space which is closed off from the outer atmosphere, at least one rotary hollow perfusion roll means situated in the interior of said enclosure means to be lapped by a web of sheet material for transporting the web along the interior of said enclosure means, said perfusion roll means having a foraminous wall through which a treating gas can pass with the treating gas first passing through a web lapping said perfusion roll means before passing through said foraminous wall thereof into the interior of said perfusion roll means, gas-circulating means communicating with the interior of said enclosure means for circulating the treating gas out of the interior of said perfusion roll means along a predetermined path directing the gas to travel back through a web lapping said perfusion roll means and then through the foraminous wall thereof into the interior of said perfusion roll means, said gas-circulating means providing the treating gas with predetermined properties while the gas is circulated along said path, inlet means operatively connected with said enclosure means at an entrance region thereof for introducing a web of sheet material in a fluidtight manner into the interior of said enclosure means to be lapped onto said perfusion roll means, outlet means operatively connected with said enclosure means at an exit region thereof for receiving a web of sheet material from said perfusion roll means and for directing the web which has been treated by the treating gas in a fluid-tight manner out of said enclosure means, said web of sheet material having an initial portion situated immediately subsequent to said inlet means in said enclosure means, the latter having in its interior a foraminous wall portion engaging and guiding said initial portion of said web prior to continued travel of the web of sheet material around said perfusion roll means, and gas-removing means communicating with a space at a side of said foraminous wall portion which is opposite said initial portion of said web for drawing treating gas through said initial portion of said web and through said foraminous wall portion into said space with which said gas-removing means communicates, said gas removing means removing the gas which travels through said initial portion of said web out of the interior

4,124,943
AUDIO VISUAL INFORMATION SYSTEM

James A. H. Mitchell, London, and Edward J. Day, Kingston Surry, both of England, assignors to Mitchell Beazley Encyclopedias, Ltd., London, England

Filed Sep. 25, 1975, Ser. No. 616,551
Int. Cl.[2] G09B *19/08*
U.S. Cl. 35—8 A 24 Claims



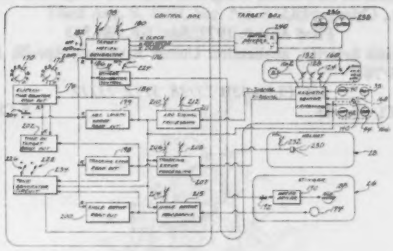
1. An audio visual information system comprising:
(a) first information means consisting of a plurality of graphic displays each concerning a particular selected topic;
(b) each of said graphic displays including a main word text and a pictorialized description each sufficient to describe its particular selected subject without reference to the other and each disposed in a separate and distinct location within its graphic display;
(c) each pictorialized description including a key illustration and a plurality of ancillary illustrations arranged in a sequence, the key illustrations of said plurality of graphic displays being sequenced.
(d) second information means constituting a graphic arrangement of alphabetically set out expanded word descriptions of a plurality of selected topics and a reproduction of selected key illustrations from said graphic displays of said first information means when such key illustrations pertain to said topics and said key illustrations being in correlation to the alphabetical arrangement of said word descriptions; and
(e) third information means constituting a recording for audio visual playback including audio visual display of a selected topic from said first information means and including at least a key illustration related to said topic, said recording being provided with index means for locating said topic, whereby the user of the system may retrieve the information of the above information means without substantial resort to text material.

4,124,944
DEVICE FOR TEACHING AND EVALUATING A PERSON'S SKILL AS A WELDER

Bruce A. Blair, Jackson, Mo., assignor to Lenco, Inc., Jackson, Mo.

Filed Jul. 8, 1977, Ser. No. 813,950
Int. Cl.[2] G09B *19/24*
U.S. Cl. 35—13 32 Claims

12. In a device to be used to simulate arc welding which includes a simulated target member representing the object to be welded, means for predeterminately moving the target member to simulate a welding path having a principal movement direction, a simulated welding rod and a holder for the rod which includes means to move the rod therein to simulate a rod burn rate, the improvement comprising means associated with the target for producing responses which vary with the position of the simulated welding rod relative to the target, said means including first and second pairs of sensor members, said first pair of sensor members being oriented substantially in alignment with the principal direction of movement of the target and said second pair of sensor members being oriented substantially transversely to the principal direction of movement of the target, and means on the simulated welding rod for

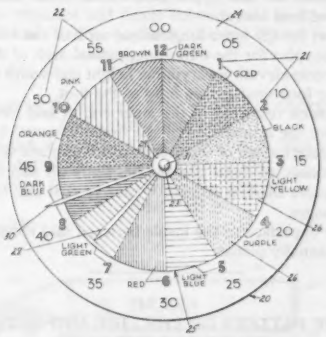


producing a magnetic field which is capable of being detected by the sensor members of said first and second pairs.

4,124,945
TIME TELLING TEACHING DEVICE

John Totten, 125 Eatons Neck Rd., Northport, N.Y. 11768

Filed Feb. 22, 1977, Ser. No. 770,622
Int. Cl.[2] G09B *19/12*
U.S. Cl. 35—39 8 Claims



1. A time telling teaching device which comprises a clock face having two separate numerical scales circumferentially and concentrically disposed thereon in spaced relationship to represent segments of time corresponding to the face of a clock, the inner scale being represented by differently colored hour numerals 1 to 12, the outer scale being represented by like colored minute numerals 00 to 55 in intervals of 5, the circular area encompassed by the inner scale being divided into twelve 30° colored arc segments each segment subsequent to the designated hour being color coordinated to correspond to the color of said respective hour numeral; and respective hour and minute hands pivotally mounted on said clock face centrally of said numerical scales, said hour hand being of such a size as to lie completely within the confines of said colored arc segments, and said minute hand being of such a size as to extend beyond said colored arc segments.

4,124,946

BUILT-IN INSOLE AND ARTICLE OF FOOTWEAR CONTAINING SAME

Benjamin B. A. Tomlin, Walgrave, England, assignor to Scholl, Inc., Chicago, Ill.

Filed Apr. 4, 1977, Ser. No. 784,518

Claims priority, application United Kingdom, Apr. 2, 1976, 14115/76

Int. Cl.[2] A43B *13/38, 3/12, 13/12*

U.S. Cl. 36—43 8 Claims

1. A preformed insole to be built into a shoe or the like during construction of the shoe, the insole having a flat underface for securement to the outer sole of the shoe, wherein the improvement comprises

the insole being formed of non-rigid material having an upperface contoured in keeping with the entire plantar face of a normal foot,

said insole being flexible to bend with the outer sole of the shoe when walking,

the entire shoe with insole secured therein being completed before a customer has seen it,

the contour of said upper face of the insole including a cupped heel socket,

a support for the inner longitudinal arch of the foot,

a mild support for the outer longitudinal arch of the foot,

a transverse elevation varying in height and width to underlie the four smaller toes only of the foot,

a depression rearward of the inner end of said elevation to receive the articulation of the first metatarsal head with the posterior end of the first proximal phalanx which with the connected distal phalanx lies flatly off said elevation,

a respective shallow recess for each of first and fifth distal phalanges,

and the upperface of the insole between said recesses being substantially planar.

4,124,947

GRAPHIC PATTERN OR THE LIKE AND METHOD OF PRODUCING THE SAME

Adolf Kuhl, Hubstrasse 13A, 8942 Oberrieden, and Ernst Heistand, Chüpliweg 6, 8702 Zollikon, both of Switzerland

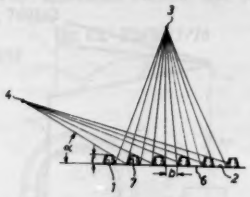
Filed Nov. 8, 1976, Ser. No. 740,130

Claims priority, application Switzerland, Nov. 14, 1975, 014889/75; Fed. Rep. of Germany, Jan. 30, 1976, 2603558

Int. Cl.[2] G09F *19/14*

U.S. Cl. 40—453 28 Claims

1. A graphic pattern for imprinting substrates, especially paper currency, stamps or the like, comprising a substrate having thereon lines in the form of lengthwise extending color mounds, said lines comprising a line pattern which is substantially uniform at least in predetermined field sections of the substrate, said line pattern comprising relatively closely situated non-intersecting and non-contacting lines, the ratio between the height of the color mounds and the spacing of the color mounds forming the lines is such that when viewing the pattern from below a predetermined boundary inclination angle the base of valleys between the color mounds is non-visible, at least certain of said lines being provided with interruptions, all of the lines at least at the regions neighboring said interruptions extending essentially in the same direction, the substrate at said interruptions being devoid of color mounds, said interruptions having a width less than the spacing between the spacing of the majority of the color mounds forming the



lines to thus render more difficult visible detection of the interruptions from a viewing angle above the predetermined boundary inclination angle while rendering the substrate at such interruptions more readily visible at a viewing angle below the predetermined boundary inclination angle due to increased contrast between the color mounds of the lines and the substrate at the interruptions.

4,124,948

FISHING DEVICE FOR AUTOMATICALLY SETTING A FISH HOOK

Edward J. Mautner, 7937 West Dr., Miami Beach, Fla. 33141

Filed Nov. 10, 1977, Ser. No. 850,072

Int. Cl.[2] A01K *97/00*

U.S. Cl. 43—15 2 Claims

2. A fishing device for setting a hook in a fish after the fish has taken the bait, the device comprising:

(a) a fixed pivot means,

(b) means to hold said fixed pivot means,

(c) a movable pivot means,

(d) guide means on said means to hold and in sliding engagement with said movable pivot means for guiding movement of said movable pivot means toward and away from said fixed pivot means,

(e) a swingable pivot means comprising an axis swingable in an elbow action about said fixed pivot means when said movable pivot means moves away from and toward said fixed pivot means,

(f) first link means having one end pivotally connected to

said fixed pivot means and a second end pivotally connected to said swingable pivot means,

(g) second link means having one end connected to said swingable pivot means and a second end pivotally connected to said movable pivot means,

(h) releasable keeper means normally interconnecting said means to hold and said swingable pivot means to hold said swingable pivot means in a predetermined position with respect to said means to hold when said movable pivot means is in a first position of extension from said fixed pivot means,

(i) resilient means normally urging said movable pivot means toward said fixed pivot means when in said first position of extension,

(j) a slide member captivated on said means to hold and slidably movable on said means to hold between said first position and a second position,

(k) said guide means including stop means to limit movement of said movable pivot means toward said fixed pivot means and said second position comprising said movable pivot means in engagement with said stop means,

(l) said slide member including a first portion extending radially away from said movable pivot means and a second portion extending radially oppositely of said first portion and away from said movable pivot means,

(m) release means to release the keeper means for movement of said slide member from said position of extension under the influence of said resilient means toward said second position,

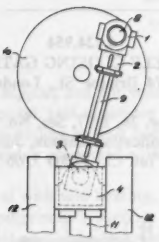
whereby when the keeper means is released, the slide member moves rapidly between said first position and said second position under the influence of said resilient means.

4,124,949

CONNECTOR AND BEARING FOR SWINGABLY MOUNTING ROD

Erik Bach, Billund, and Jan Ryaa, Randbol, both of Denmark, assignors to Interlego A.G., Switzerland

Filed Jun. 20, 1977, Ser. No. 808,040
Claims priority, application Denmark, Jul. 30, 1976, 3444/76
Int. Cl.[2] A63H *33/08*
U.S. Cl. 46—23 **5 Claims**



1. A connector for swingable mounting of a connecting rod in a toy building set, said connector comprising:

(a) a bearing housing comprising a hollow open faced toy building element having a bottom and four walls and a pair of oppositely disposed substantially U-shaped recesses defining a pair of bearings,

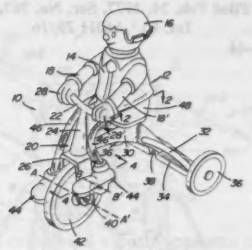
(b) a swingable member comprising a pair of tubular elements disposed at a right angle relatively to one another, one of said tubular elements having a pair of cylindrical pivots extending at either side thereof of a size adapting them to be laterally inserted into said recesses for pivotal mounting in said bearings, the other tubular element having it's bore adapted to receive one end of a connecting rod.

4,124,950

ACTION TOY

James R. Becker, Kings Point, N.Y., assignor to Kohner, Inc., New York, N.Y.

Filed Aug. 8, 1977, Ser. No. 822,854
Int. Cl.[2] A63H *17/18*
U.S. Cl. 46—109 **5 Claims**



1. An action toy including a crank shaft and a motive member for imparting rotary motion to the shaft, comprising:

a toy figure,

an elastomeric member fixedly coupled at one end to said toy figure,

pedal means rotatably mounted on said crank shaft for performing a pitching movement as said crank shaft is rotated, said pedal means having a chamber, a lateral groove which opens into a recess transverse thereto, and a partition disposed above said groove,

said crank shaft having an end portion which is seated in said groove, said end portion terminating in said transverse recess and having a washer mounted thereon, whereby said partition and washer retain said crank shaft end portion within said groove and recess,

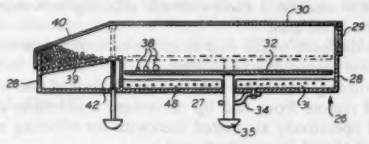
said elastomeric member being anchored at another end inside said pedal means chamber whereby said elastomeric member stretches and flexes between said anchored end and said end fixedly coupled to said toy figure.

4,124,951

MAGNETIC PARTICLE TOY WITH MAGNETIC RETAINING MEANS

Alfred H. Walich, c/o Walco Toy Co., Inc., 38 W. 37th St., New York, N.Y. 10018

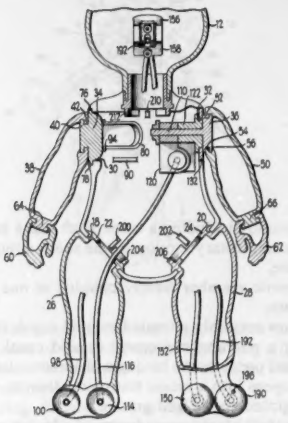
Filed Dec. 17, 1976, Ser. No. 751,667
Int. Cl.[2] A63H *33/26*
U.S. Cl. 46—238 **18 Claims**



1. A toy adapted to be used with a magnet or stylus comprising a box, a base plate within the box and having an operative position, the base plate having a relatively flat upper surface with an operating area and a bottom surface, a transparent cover for the box spaced from the base plate when in operative position a distance approximating the limit of the magnetic attraction of the magnet, a plurality of magnetizable particles for use on the base plate, a magnetic plate having a dimension coextensive with the operating area and located beneath the base plate, one of said plates being fixed and the other plate being mounted for movement towards and away from the other, and means connected with the movable plate to move the same towards and away from the other plate to retain the

particles in position on the base plate when the plates are together.

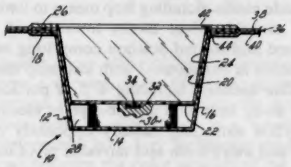
4,124,952
ARTICULATED DOLL
Rouben T. Terzian, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.
Filed Feb. 14, 1977, Ser. No. 767,391
Int. Cl.[2] A63H *29/16*
U.S. Cl. 46—44 **23 Claims**



1. An articulated doll, comprising,
a doll torso supporting a head and leg components;
a mouth defined on said head and including spaced apart lip members and a central defined mouth opening;
a first articulated arm with attached hand supported on said torso and including means for controlling rotational movement of said first arm to cause a hand raising and lowering motion;
actuating means disposed within the foot of one of said legs remote from said first arm controlling means and operatively associated therewith for effecting movement of said first arm;
a second articulated arm with attached hand supported on said torso and including means for controlling pivotal movement of said second arm to cause a side-to-side hand motion across said head;
actuating means disposed within the foot of one of said legs remote from said second arm controlling means and operatively associated therewith for effecting movement of said second arm;
means disposed within said head for controlling movement of said spaced apart lip members;
lip actuating means disposed within the foot of one of said legs remote from said lip movement controlling means and operatively associated therewith for effecting movement of said lip members; and
mouth actuating means disposed within the foot of one of said legs remote from said mouth opening and operatively associated therewith for effecting the intake of fluids through said mouth opening.

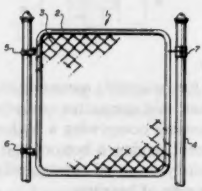
4,124,953
PLANTER KIT AND DISPLAY PACKAGE THEREFOR
Harold Y. Patton, 2606 Madison Rd., Cincinnati, Ohio 45208
Filed Dec. 2, 1976, Ser. No. 747,010
Int. Cl.[2] A01G *9/02*
U.S. Cl. 47—66 **1 Claim**

1. A planter kit and package assembly comprising the combination of a planter kit and a package,
said planter kit including
a container in the form of a a deep dish having a base, a side wall, and an annular rim projecting outwardly from said side wall;
a cover also in the form of a deep dish having a bottom, a side wall, and an annular rim projecting outwardly from the side wall of said cover, said cover nesting in said container with said rim of said cover seated on said rim of said container, the depth of the cover being less than that of said container so that the bottom of said cover is spaced from said base of said container to provide a space therebetween, the side walls of said container and cover being tapered and in facial engagement, said cover being adapted to be inverted and its rim placed on the rim of said container to provide a germination chamber when said planter kit is assembled;



and a water expansible growing medium in the form of a small, dry, compressed pellet which is received in said space between the bottom of the cover and the base of the container, said space being sized to constrain said pellet therein;
said package comprising
a single planar sheet folded upon itself to form overlying planar leaves, the leaves including through openings, the said openings being aligned with one another whereby a container of a second similar planter kit can be inserted through said openings and nested in the cover of the first described planter kit;
said container and cover projecting through one of said openings with the said rims thereof being mated between said leaves,
the said leaves secured together to trap the rims of the container and cover between them.

4,124,954
SELF-CLOSING GATE
Daniel J. Redick, 174 Briscoe St., London, Ontario, Canada (N6C 1X3)
Filed Apr. 26, 1977, Ser. No. 790,950
Claims priority, application Canada, Jun. 18, 1976, 255254
Int. Cl.[2] E05D *7/06*
U.S. Cl. 49—236 **8 Claims**



1. A self-closing gate construction comprising:
(a) a gate,
(b) first and second vertically extending gate posts positioned on each side of the gate,
(c) an upper gate hinge extending between the first gate post and one side of the gate, a hinge pin extending upwardly from the hinge and an eye bolt extending through the

frame of the gate and fitting over and riding on the hinge pin,

(d) a lower gate hinge extending between the first gate post and one side of the gate, a hinge pin extending downwardly from the hinge, and an eye bolt extending through the frame of the gate and fitting on and riding about the hinge pin,

(e) a gate latch extending between the second gate post and the side of the gate opposite the side that has the upper and lower gate hinges,

(f) the gate being capable of opening in one direction only and not beyond a point where the gate will not self-close, and

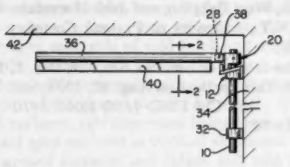
(g) the upper and lower gate hinges being non vertically aligned with one another, so that the pivot of rotation of the lower hinge is set outwardly in the direction of the gate opening and the lower hinge eye bolt is of greater length than the upper hinge eye bolt, so as to provide universal movement of the gate on the hinge pins and to force the gate upwardly, so to provide a self-closing action by the force of gravity whereby the gate returns to the closed position from the open position.

4,124,955

AUTOMATIC CLOSURE

August J. Kochis, Concord, Mass., assignor to Eckel Industries, Inc., Cambridge, Mass.

Filed May 13, 1977, Ser. No. 796,805
Int. Cl.² E05F *1/04*
U.S. Cl. 49—237 **15 Claims**



1. A combination support and automatic closure apparatus for use with a door panel, said apparatus comprising:

journaling means including at least one bearing;

a vertical post rotatably supported adjacent its upper end in said bearing;

a cam track integral with said bearing;

a cam follower comprising a support section surrounding and affixed to said post and a follower section disposed to follow said track, said cam follower being adapted to return to a home position on said track when displaced therefrom;

fastening means secured to said support section of said cam follower and extending in a direction substantially perpendicular to said post; and

first and second split sleeves coaxially mounted on said fastening means and on said post respectively for joint movement about the axis of said post;

each of said sleeves including a pair of parallel flanges running substantially the length of the corresponding sleeve;

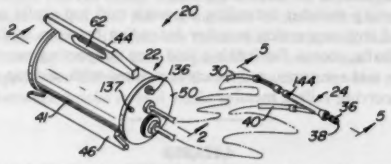
said flange pairs being positioned to bracket mutually perpendicular edges of a common plane defined therebetween, whereby a top edge section and a side edge section of a panel may be disposed between and supported by the flanges of said first and second sleeves respectively.

4,124,956

CUTTING SYSTEM WITH DEBRIS VACUUMING MEANS

Lewis R. Levinson, 23 Sandstone La., Willingboro, N.J. 08046

Filed Jul. 22, 1977, Ser. No. 818,176
Int. Cl.² B24B *23/00, 55/06*
U.S. Cl. 51—273 **10 Claims**



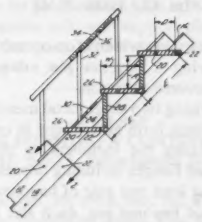
1. A combined cutting and vacuum apparatus comprising a cutting device having a vacuum shroud, a remote housing having a vacuum motor disposed therein, a flexible drive shaft powering said cutting device from said motor and a flexible vacuum tube producing a vacuum at said shroud, said motor including a rotary shaft having a first end portion of which an impeller is secured and to which said flexible drive shaft is connected, said housing also including a vacuum chamber mounted over said impeller, with a portion of said rotary shaft extending therethrough, said vacuum chamber having an inlet port laterally offset from said rotary shaft, removable filter means mounted within said housing between said port and said vacuum tube, said cutting device including an abrading bur, said shroud being a tubular member having a free end having a flared mouth, said cutting device being releasably secured by holding means within said shroud with said bur extending from the interior of the free end of the shroud to slightly outside said mouth, said holding means comprising ring means disposed within said shroud surrounding said cutting device and frictionally engaging said cutting device to locate said cutting device centrally in said shroud and engagement means engaging a portion of said cutting device to secure said cutting device at said centrally located position, said shroud including a vacuum tube coupling communicating with the interior of the free end of the shroud and extending at an acute angle thereto to connect said vacuum tube to said shroud so that the vacuum produced by said motor effects the withdrawal of material abraded by the bur into the shroud.

4,124,957

STRUCTURAL IMPROVEMENTS FOR STAIRS OR STAIRS WITH VARIABLE GEOMETRY

Robert A. Poulain, 588, Chaussée Bara, Waterloo, Belgium

Continuation-in-part of Ser. No. 792,733, May 2, 1977, abandoned. This application Aug. 8, 1977, Ser. No. 822,785
Claims priority, application Belgium, May 3, 1976, 166672
Int. Cl.² E04F *11/06*
U.S. Cl. 52—183 **4 Claims**



1. A staircase comprising a pair of parallel stringers having a plurality of steps extending therebetween, each of said string-

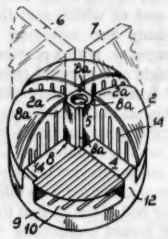
ers comprising an upper and a lower shaft, said shafts being parallel to each other, and being longitudinally movable with respect to each other, said shafts having a mating tongue and groove arrangement for movement relative to each other, each of said shafts having a plurality of apertures therein, a plurality of step supporting members extending between respective top shafts and respective bottom shafts through said apertures therein, each of the steps being supported by at least a first step supporting member extending between said top shafts and a second step supporting member extending between said bottom shafts, means for locking said step supporting members within said apertures, and means associated with said top shaft for receiving railing members.

4,124,958

SPHERICAL JUNCTION ELEMENT FOR COMPOSABLE DISPLAY STRUCTURES

René Chiche, Paris, France, assignor to Rufuss Establishment, Mauren, Liechtenstein

Filed Jul. 12, 1977, Ser. No. 814,870
Int. Cl.[2] E04B *1/00*
U.S. Cl. 52—285 **3 Claims**



1. A spherical junction element for composable display structures, comprising a body having at least one partially spherical outside surface, at least one flat outside surface intersecting said partially spherical surface, at least one slot in said partially spherical surface perpendicular to at least one said flat surface for fittingly receiving therein a plate like component member and for defining a base plane with at least one said flat surface, a pin in said slot having a diameter less than the gap of said slot, and a reinforcing sleeve element pulled over said pin, said sleeve element having at least two surface portions adapted to engage mating surface portions of said slot.

4,124,959

CLOTHES DRIER SOCKET

Barry C. Hill, Seaview Downs, Australia, assignor to Hills Industries Limited, Edwardstown, Australia

Filed Aug. 11, 1977, Ser. No. 823,676
Claims priority, application Australia, Aug. 16, 1976, PC7004
Int. Cl.[2] E02D *27/42*
U.S. Cl. 52—298 **6 Claims**

1. A clothes drier socket which is co-operable with a clothes drier standard having a bayonet pin extending outwardly therefrom in a transverse direction,

the socket comprising two sheet metal members each having two flanges which form an L shape in cross-section, and means interlocking the members so that they form a square tube, said flanges including depressions surfaces of which define at least one pair of bayonet slots to receive the ends of said bayonet pin, each slot having an entry limb which extends transversely and a retaining limb which extends longitudinally,

the arrangement being such that the standard is insertable into the socket with the bayonet pin out of alignment of the bayonet slots, but upon rotation after insertion the ends of the pin move into register with the entry limbs of

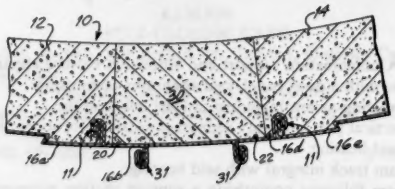
the slots and are guided by the defining surfaces thereof into the retaining limbs.

4,124,960

PRESTRESSED CONCRETE TANK HAVING SEAMED DIAPHRAGM JOINTS SECURING ADJACENT PRECAST CONCRETE PANELS

Bill R. Bush, West Babylon, and Jack Hornstein, Old Bethpage, both of N.Y., assignors to Preload Company, Inc., Garden City, N.Y.

Continuation-in-part of Ser. No. 636,729, Dec. 1, 1975, Pat. No. 4,043,089. This application Aug. 18, 1977, Ser. No. 825,832
Int. Cl.[2] E04D *1/00*; E04C *3/10*
U.S. Cl. 52—583 **8 Claims**



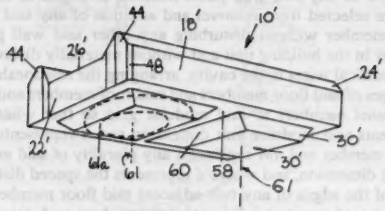
1. An improved prestressed concrete tank having a core wall comprising elongated panels of precast concrete assembled in space, side-by-side relationship, each of said panels having on a face a sheet of sheet metal presenting parallel longitudinal undercut channels and a lateral, sheet metal flange extending parallel with the elongated sides of said panels and laterally outwardly therefrom, said sheet metal flange having a lip on the outermost edge of said flange which extends from the tank in the direction substantially perpendicular to the panel, said flange lips of adjacent panels being spaced from one another; a sheet metal, channel shaped splice member interposed in said space between the flange lips of adjacent panels, said splice member having upstanding sides which abut the flange lips of adjacent panels and said flange lip and abutting upstanding side being seamed together in a tight fold, thereby locking adjacent precast concrete panels together with a watertight seam.

4,124,961

BUILDING BRICK

Willie Habegger, deceased, late of Currumbin, Australia (by Carl Habegger, executor), assignor to Lock Brick Limited, Toronto, Canada

Filed Jun. 14, 1977, Ser. No. 806,399
Int. Cl.[2] E04C *1/10, 1/30*
U.S. Cl. 52—592 4 Claims



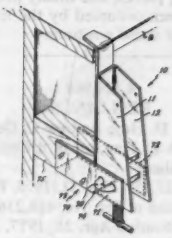
1. A building brick having:
(a) upper and lower faces
(b) first and second end faces,
(c) first and second side faces,
(d) said upper face having a pair of parallel upstanding ridges one adjacent each side of said brick and each ridge extending substantially the entire length of said brick, said upper face having a first recessed portion between said ridges, and said first recessed portion extending substantially the entire length of said brick,
(e) each ridge being substantially triangular in form, having an outer surface which slopes steeply in a direction towards its adjacent side face and towards said bottom face to form, when one said brick is placed atop another, an edge recess extending along each side of the join between adjacent said bricks, each ridge also having a narrow flat apex surface, and an inner surface which slopes steeply laterally inwardly toward said recessed portion,
(f) said lower face having a pair of narrow flat depressed surfaces one at each side of said brick and extending substantially the entire length of said brick, and a raised portion between said depressed surfaces, said raised portion having sides which slope laterally outwardly to meet said depressed surfaces, said depressed being located vertically beneath said apex surfaces in vertical alignment therewith,
(g) said depressed surfaces and ridges and said raised and recessed portions being complimentary in height and location so that when one brick is placed atop another, said inner surfaces of said ridges meet and lie against said sides of said raised portion to align said faces of said bricks and to restrain sideways movement of one of said bricks relative to the other and said depressed surfaces of the upper brick rest sealingly on said flat apex surfaces thereby carrying the weight of the upper brick,
(h) the projection of said ridges beyond said first recessed portion being at least 0.3 cm greater than the projection of said raised portion beyond said depressed surfaces, to provide a horizontal space at least 0.3 cm high between successive rows of said bricks for bonding material, the width of said space being at least 40 percent of the width of said bricks,
(i) said first end face having a pair of projecting vertical edge portions, one adjacent each ridge of said brick and extending substantially the entire height of said brick, and having a second recessed portion between said edge portions, said second recessed portion extending substantially the entire height of said brick,
(j) said second end face having a pair of flat end surfaces one adjacent each side of said brick and extending substantially the entire height of said brick, and a central portion between said flat end surfaces, said flat end surfaces and said vertical edge portions, and said second recessed portion and said central portion being complimentary so that when said first and second end faces of two said bricks are placed end to end, said flat end surfaces lie sealingly against said vertical edge portions,
(k) said second recessed portion and said central portion defining between the first and second end faces of said bricks placed end to end a vertical space extending the entire height of said bricks for containing bonding material, said vertical space being at least 0.3 cm thick and the edges thereof being sealed by contact of said edge portions against said flat end surfaces of such other brick, so that when said bricks are assembled into a wall, flowable bonding material may be poured into one of said vertical spaces for filling other said vertical and horizontal spaces between bricks in said wall.

4,124,962

JOIST HANGER

Harry B. Lancelot, III, and Robert M. MacRobbie, both of Fort Worth, Tex., assignors to Brown Company, Pasadena, Calif.

Filed Jul. 15, 1977, Ser. No. 816,002
Int. Cl.[2] E04B *1/38*
U.S. Cl. 52—702 25 Claims



1. A joist hanger for being depended from a beam, having a shroud being comprised of an integral structure of a rear wall and two parallel side walls, and further having an L-shaped angle element connected to the rear wall of the shroud and adapted for depending the hanger from the beam, the improvement comprising in combination:
a rectangular opening in the rear wall;
two bores in each of said side walls and being aligned in pairs, and having their respective upper portion in approximate horizontal alignment with the lower horizontal ledge of said opening of said rear wall;
a jack screw assembly, including a plate with a centrally positioned threaded bore and having a threaded bolt threadily received by the bore;
a release pin means having two parallel but spaced apart legs for insertion into said bores in said sidewalls to establish a horizontal support plane in between the sidewalls of said shroud and for positioning said plate upon the two legs of the pin means as an end of said plate is inserted into said opening while the threaded bolt traverses the space in between the two legs of the release pin means; and
a support plate for positioning a joist in the shroud at one end of the jack screw bolt, said support plate being journaled on said bolt for being held without rotation in the shroud upon turning the jack screw.

4,124,963

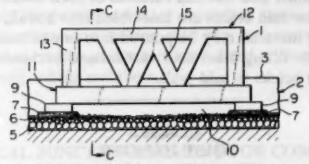
METHOD FOR FORMING A CONTINUOUS FOOTING

Tadayasu Higuchi, 5-6-15, Sakuragaoka Setagaya-ku, Tokyo, Japan

Filed Jan. 30, 1978, Ser. No. 873,625
Claims priority, application Japan, Feb. 8, 1977, 52-12168
Int. Cl.[2] E04B *1/00*
U.S. Cl. 52—742 4 Claims

1. A method for forming a continuous footing for building a house comprising digging trenches in accordance with the

layout of a house to be built, laying rubble and gravel on the bottom of the trenches, leveling only the positions where the ends of each pre-fabricated footing block are to be placed by laying sand thereon, placing a leveling piece (slab) on each of such positions, placing pre-fabricated footing blocks in the trenches so that each block bridges each two of the leveling pieces or two blocks form a T junction thus forming a continuous footing, supplying additional gravel to fill the spaces under the footing blocks and between the footing blocks and the sides of the trenches, compacting the rubble and gravel until they are tightly packed to the bottom of the blocks, thereafter removing the leveling pieces, and finally placing gravel in the spaces which have been occupied by the leveling pieces and compacting the bed at those positions.



4,124,964

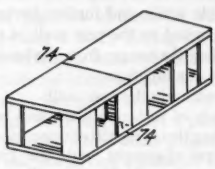
BUILDINGS

Ivan B. Juriss; Roger D. Hay; Andrew C. Goodfellow; Thomas Townson, and Keith E. Hay, all of 8 Copsey Pl., Avondale, Auckland, New Zealand

Division of Ser. No. 627,857, Oct. 31, 1975, Pat. No. 4,067,159, which is a continuation of Ser. No. 418,216, Nov. 23, 1973, abandoned. This application Apr. 25, 1977, Ser. No. 790,387

Int. Cl.[2] **E04B** *1/35*

U.S. Cl. 52—745 **1 Claim**



1. A method of constructing a building cluster comprising the steps of manufacturing in a factory a plurality of building units, each said building unit forming at least one room at least when connected to one or more adjacent building units, each said building unit being constructed separately from any other building unit in said building cluster by using a stressed skin floor member and a stressed skin roof member both the same length and width, and a plurality of wall panel members on at least two sides of said separately constructed building unit, disposing said wall panel members between said floor member and said roof member, removably connecting said wall panel members to said flor member and said roof member by inserting lug members on the center line of the top and bottom edges of said wall panel members, arraging at least some of which removable connections of said lugs to the edges of said floor members to said floor member and said roof member by insertto side sway or lozenging forces on said building unit without changing the configuration of said wall panel members, each said building unit being of a width and length selected from a plurality of a modular unit dimension, said plurality of a modular unit dimension being arranged in two directions as a horizontal modular grid, each said building unit being arranged to be joined together to form said building cluster so that the center line of any joint between said building units coincides with any selected grid line of said moldular grid and so that any wall between any two adjacent said rooms formed by any two adjacent said building units is a wall common to both said building units, and is further arranged so that the center line of said wall coincides with the center line of any said joint between said building units and with said selected line of said modular grid, spacing said wall panel members apart from but connected to each other in their vertical edges by use of removable spacing members such that at the connection of at least two said wall panel members a continuous cavity is formed the least dimension of which is at least concident with the thickness of any said wall panel member arranged to enable changes selected from removal and addition of any said wall panel member without disturbing any other said wall panel member in the building unit and without materially disturbing any electrical wires in the cavity, arranging the relationship of the edges of said floor members and said roof members and said wall panel members to said modular grid so that where M represents said modular unit dimension and *n* represents any whole member and *n*M represents any plurality of said modular unit dimension, and where *d* represents the spaced distance apart of the edges of any two adjacent said floor members or the edges of any two adjacent roof members and coincides with the thickness of any one said lug *t* represents the thickness of any one said wall panel member and is always greater than *d* then any said floor member and any said roof member has a length or width of *n*M-*d* and any said wall panel member has a width of no greater then *n*M-*t* and no less than *n*M-2*t* so that any said floor member or any said roof member or any said wall panel members has a fixed relationship of its vertical edges to said modular grid regardless of the plurality of modular unit dimensions selected for its horizontal dimensions, and so that the intersection of the center lines of at least three said wall panel members, when one side wall panel member is at right angles to the other two said wall panel members, will coincide with the center line of the joint between at least two building units and with the intersection of the lines of said horizontal modular grid with the vertical edges of these panels a fixed distance away from said intersection so that such vertical edges define a space between the panels, transporting said plurality of building units to a building site, arranging said plurality of building units in a building cluster when mounted on previously prepared foundations, removably fixing said building units to each other and to said foundations, and completing said building by providing a roof over said building cluster, joint covers between said building units, and connections to electrical and plumbing supply and the like available on said building site and arranging the center line of any joint between any two said building units, and the center line of any wall, being either a common wall between any two said building units, or an exterior wall to said building cluster to coincide with any selected grid line of said modular grid, thus enabling said plurality of building units to be arranged in any desired form or size of building cluster.

4,124,965

METHOD FOR PRODUCTION OF CENTRIFUGAL RELEASE BAG

Robert M. Stahl, Indianapolis, Ind., assignor to Bio-Dynamics Inc., Indianapolis, Ind.

Division of Ser. No. 714,249, Aug. 13, 1976, abandoned, which is a continuation-in-part of Ser. No. 563,562, Mar. 31, 1975, abandoned. This application Jul. 5, 1977, Ser. No. 812,496

Int. Cl.[2] **B65B** *3/02, 61/02*

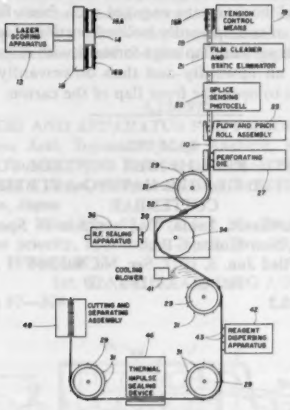
U.S. Cl. 53—412 **3 Claims**

1. A method for making centrifugal release bags having one seam of predetermined strength sufficiently weak to fail and open under the action of centrifuging means to permit the flow of the substance contained in said bags into a test chamber comprising the steps of:

(a) obtaining a length of flexible film material;

(b) laser scoring said flexible film material to form a U-shaped linear depression for substantially the entire length of said flexible film material, said scoring reducing the thickness of said flexible film material by more than about

50% at said linear depression and to a uniform residual thickness to fail at a predetermined centrifugal speed;
(c) folding said flexible film material along said linear depression such that a structure having two opposed sides and a bottom edge is formed;
(d) sealing portions of said opposed sides at predetermined intervals to form bags having one open end;



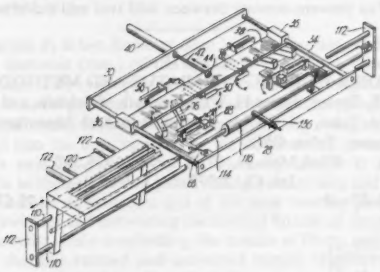
(e) injecting a substance into said bag through said open end;
(f) sealing said open end after said substance has been injected; and
(g) dividing the series of bags into subgroups by suitable cutting means.

4,124,966

AUTOMATIC WICKETTED BAG LOADER

Lowell A. Wilson, Burlington, Canada, assignor to Bonar & Bemis, Ltd., Burlington, Canada

Filed Jan. 3, 1977, Ser. No. 756,203
Claims priority, application Canada, Dec. 9, 1976, 267496
Int. Cl.² B65B *1/00, 3/00, 5/00, 43/34*
U.S. Cl. 53—452 **19 Claims**



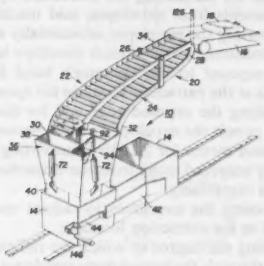
1. Apparatus for loading a bag with a commodity comprising:
(a) a framework;
(b) a carrier member retractably mounted in said framework;
(c) means for arranging at least one empty bag in said framework, said bag having an open end adjacent said carrier member;
(d) means for opening said bag and retracting said carrier member, said member serving to hold said bag open;
(e) means for gripping opposed top edge portions of said opened bag, said gripping means including, for each of said opposed edge portions of said opened bag, a rod rotatable into said bag opening and a clamping block to which said rod is pivotally mounted, said rod, upon rotation into said bag clamping the adjacent bag edge portion against said clamping block;
(f) means for moving said gripping means apart thereby bringing opposed faces of said bag into close juxtaposition; and
(g) means for clamping said opposed faces together and removing the clamped bag from said framework.

4,124,967

METHOD AND APPARATUS FOR PLACING FLEXIBLE PACKAGES IN CONTAINERS

Frederick W. Beer, 270 Timberbank Blvd., Unit 55, Agincourt, Ontario M1W 2M1; Fedor P. Kresak, 31-12 Sentinel Rd., Downsview, Ontario, and Conio Kuev, 620 Lolita Gardens, Apt. 1909, Mississauga, Ontario, all of Canada

Filed Sep. 19, 1977, Ser. No. 834,559
Int. Cl.² B65B *35/ 54, 57/08, 57/16*
U.S. Cl. 53—446 **33 Claims**



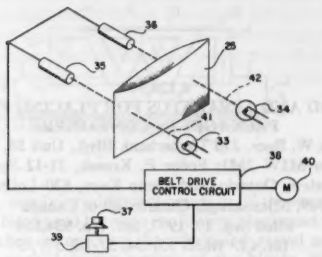
17. A method of packaging flexible package in a rigid container comprising:
(a) feeding the packages along a conveyor line in single file,
(b) separating the packages and directing single packages alternately into respective ones of a plurality of chutes;
(c) allowing each of the packages to travel individually along the chutes and causing each package to pass into a respective one of a plurality of vertically disposed pockets of a rotatable load head, and, after the last one of a first group of the packages has been located in a respective pocket of the load head,
(d) rotating the load head to position a further plurality of pockets thereof in locations each to accept a respective one of the packages of a second group from the chutes and, after the last one of the second group of packages is in a respective one of the further plurality of pockets,
(e) releasing all four packages simultaneously from the pockets of the load heads such that they fall by gravity into a rigid container positioned below the load head,
(f) the pockets of the loading head being arranged to hold the packages in preselected upright orientation relative to one another, with the release of the packages being effected such that the preselected orientation of the packages is substantially retained as they drop into the rigid container, the container being shaped and dimensioned to snugly receive the packages and to maintain the orientation thereof;
(g) moving the filled container away from beneath the load head and moving an empty container into position below the load head,
(h) and continuing to carry out the above recited steps to effect packaging of groups of packages in successive rigid containers.

4,124,968

CONTENT ACTIVATED ENVELOPE EXTRACTION

Albert F. Stevens, Moorestown, and Paul E. Haley, Hammontown, both of N.J. assignors to Opex Corporation, Cherry Hill, N.J.

Filed Jul. 8, 1977, Ser. No. 813,810
Int. Cl.[2] B65B *43/30*
U.S. Cl. 53—381 R **14 Claims**



1. In a machine for facilitating the extraction by an operator's hand of contents from envelopes, said machine having means for transporting the envelopes substantially unspread in succession to a location at which each envelope is presented with one edge exposed to the operator's hand for content extraction, means at the extraction location for spreading each envelope open along the exposed edge and for discontinuing the spreading to permit the envelope to again become substantially unspread, and means for further transporting the envelopes substantially unspread away from the extraction location, the improvement comprising:

means for exposing the envelopes to radiant energy while spread open at the extraction location;

means for sensing the degree to which the radiant energy is transmitted through the spread open envelopes dependent on the presence or absence of contents in the envelopes; and

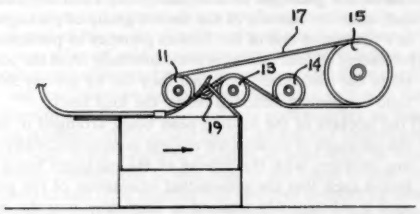
means responsive to the sensing means to initiate the means for discontinuing of spreading and the means for transporting away of the envelopes in the absence of the contents.

4,124,969

BOX OPENING APPARATUS

John J. Peyton, Santa Barbara, Calif., assignor to Industrial Automation Corporation, Santa Barbara, Calif.

Filed Aug. 1, 1977, Ser. No. 820,594
Int. Cl.[2] B65B *43/39*
U.S. Cl. 53—382 **29 Claims**



1. Apparatus for opening the front flap of a carton moving on a conveyor system in synchronization with such apparatus, comprising:

a hook means for engaging a carton flap;

means for repeatedly disposing said hook means through a trajectory generally disposed in the direction of conveyor movement and over the conveyor, said trajectory including an upwardly inclined movement and a downwardly inclined movement, said upwardly inclined movement being initiated from a first point having a first height relative to the conveyor lower than the elevation of the top of the carton sides;

means for driving said hook means through said upwardly and downwardly inclined movements of said trajectory at a speed faster than the movement of said carton on said conveyor;

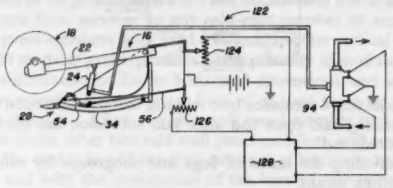
whereby said hook means engages such front flap at the beginning of said upwardly inclined portion of said trajectory and urges said flap edge forward with respect to the carton in an upwardly and then downwardly inclined movement to open the front flap of the carton.

4,124,970

AUTOMATIC REEL HEIGHT CONTROL FOR A HARVESTER HEADER HAVING A FLEXIBLE CUTTERBAR

Richard P. Bernhardt, Leola, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Jun. 3, 1977, Ser. No. 803,086
Int. Cl.[2] A01D *67/00*
U.S. Cl. 56—10.2 **14 Claims**



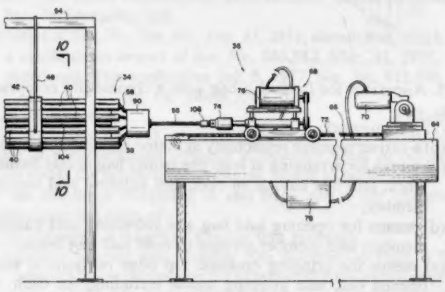
1. An agricultural harvester having a forward end, a header supported on said forward end and including a reel rotatable about a horizontal axis on said header and a flexible cutterbar supported on said header normally below the level of the path of movement of said reel, and power means operable to move the axis of said reel vertically relative to said cutterbar, in combination with control means operable automatically to energize said power means to space said reel above the highest portion of said flexible cutterbar during harvesting operation thereof to prevent contact between said reel and cutterbar.

4,124,971

CABLE WINDING APPARATUS AND METHOD

Edwin K. Taylor; James H. Williams, both of Bristow, and Fred Kobos, Tulsa, all of Okla., assignors to Arch Manufacturing Company, Tulsa, Okla.

Filed Mar. 21, 1977, Ser. No. 779,597
Int. Cl.[2] D07B *1/12, 7/00*
U.S. Cl. 57—9 **22 Claims**



1. A wire winding apparatus for wrapping an elongated rod

with wire strands for forming flexible wire wound cable, said wire strands being in the form of individual helical coils, the apparatus comprising:

(a) coil guide means for radially guiding at least one helical coil inwardly toward a centrally disposed rod;
(b) coil guide support for supporting said coil guide means;
(c) first rod support carried by the coil guide support for longitudinally supporting said rod;
(d) winding means comprising a second rod support engageable with one end of the rod, said winding means capable of providing relative rotational and longitudinal movement between said rod and said coil guide means.

4,124,972

PROCESS AND APPARATUS FOR PRODUCING YARNS

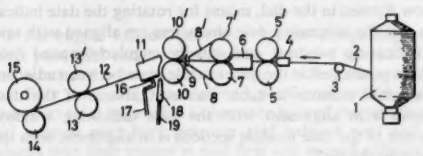
Yoshiyasu Arai, Toyonaka; Meiji Anahara, Kyoto; Masanori Saka, Suzuka; Tokio Kokubu, and Kunio Takeuchi, both of Otsu, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed May 18, 1977, Ser. No. 798,031

Claims priority, application Japan, Jan. 10, 1977, 52-1810; Jan. 12, 1977, 52-2723

Int. Cl.[2] D01H *5/28*; D02G *1/04*

U.S. Cl. 57—328 **16 Claims**



1. A method of producing a spun yarn, comprising: continuously delivering from the front rollers a draft frame a bundle of fibers which have been drafted, feeding the drafted bundle of fibers directly through an upstream portion, a small diameter throttle portion and a downstream portion of a yarn twisting passageway having the dimensions in the relationship:

$$2/\sqrt{Ne} < d_1 < 7/\sqrt{Ne}$$

$$0.25 \leqq d_1/d_2 \leqq 0.7$$

$$1/d_1 \leqq 6$$

wherein d_1 is the diameter (mm.) of the throttle portion, d_2 is the diameter (mm.) of the upstream end of the downstream portion of the yarn passageway, 1 is the axial length (mm.) of the throttle portion, and Ne is the yarn count (English type cotton count) of the yarn being spun; feeding a single stream of fluid into the upstream end of the downstream potion of the yarn twisting passageway eccentrically of and at an acute angle to the axis of said yarn twisting passageway and inclined toward the downstream end of the yarn twisting passageway for twisting and untwisting the drafted bundle of fibers with a false twist while overfeeding the bundle of fibers, and delivering the thus twisted and untwisted bundle of fibers through delivery rolls and winding the delivered spun yarn.

9. A spinning apparatus comprising: a set of drafting rollers having a pair of front rollers; delivery rollers spaced from said front rollers; and a false-twist nozzle between said front rollers and said delivery rollers and immediately adjacent said front rollers, said false-twist nozzle having a yarn passageway composed of an upstream portion, a throttle portion and a downstream portion, and a single fluid conduit opening into the upstream end of the downstream portion of said yarn passageway eccentrically and at an acute angle to the longitudinal axis of said yarn passageway and inclined toward the downstream end of the yarn passageway said yarn passageway having dimensions in the relationship:

$$2/\sqrt{Ne} < d_1 < 7/\sqrt{Ne}$$

$$0.25 \leqq d_1/d_2 \leqq 0.7$$

$$1/d_1 < 6$$

wherein d_1 is the diameter (mm.) of the throttle portion, d_2 is the diameter (mm.) of the upstream end of the downstream of the yarn passageway, l is the axial length (mm.) of the throttle portion, and Ne is the yarn count (English type cotton count) of the yarn to be spun; and means connected to said fluid conduit for supplying fluid under pressure thereto.

4,124,973

THICK AND THIN YARN AND PROCESS THEREFOR

Karl-Hermann Hense, Erlenbach; Rudolf Heb, Elsenfeld, and Thomas Zang, Hosbach, all of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Apr. 11, 1977, Ser. No. 786,327

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 2616786

Int. Cl.[2] D02G *1/02, 3/34, 3/38*

U.S. Cl. 57—207 **9 Claims**

1. A yarn comprising at least one textured core and one separately textured effect yarn, wherein the core yarn is covered periodically along the length with two or more helical wraps of the effect yarn to form a nubby thickening, the helical wraps being reversed in each adjacent wrap but characterized by a constant helical direction.

6. A process for the manufacture of a thick-and-thin yarn comprising the steps of:

(a) separately texturing an effect yarn,
(b) feeding a core yarn to a heating zone to soften the core yarn;
(c) withdrawing the core yarn from the heating zone and converging the effect yarn under essentially tensionless conditions while simultaneously wrapping the effect yarn around the core yarn in a constant direction; and,
(d) periodically moving the point of convergence along the core yarn at a speed greater than the travel speed of and in the direction of travel of the core yarn for a determined length, then returning the point of convergence to its original position.

4,124,974

YARN TWIST ARRANGEMENT

Jimmy Taylor, Candler, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Filed Apr. 26, 1977, Ser. No. 790,934

Int. Cl.[2] D01H *7/92*

U.S. Cl. 57—339 **7 Claims**

1. A yarn friction false twist arrangement which includes a base plate, at least three equiangularly spaced shafts arranged on the base plate, a plurality of friction disks arranged on each

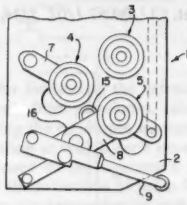
of the shafts such that the disks on respective shafts overlap to define a path for a strand of yarn, one of said shafts being fixedly connected with respect to the base plate and the other shafts each being mounted on a moveable mounting means so as to be displaceable with respect to the base plate, the improvement comprising:

said moveable mounting means comprising a pivot arm means that is arranged on the base plate for mounting one of the displaceably mounted shafts;

means for adjusting a position of one of the displaceably mounted shafts with respect to the base plate and the remaining shafts by contacting said moveable means, said adjusting means including an adjusting surface means for engaging a portion of said pivot arm means to displace said pivot arm means upon an adjusting of said adjusting means;

means provided at the base plate for engaging and accommodating said adjusting means;

means arranged at the base plate for securing said adjusting



means in an adjusted position in contact with said moveable mounting means without changing the adjusted position and without effecting further movement of said mounting means, said securing means comprising a first member formed of malleable metal arranged at the base plate for directly engaging a portion of said adjusting means to prevent a movement thereof after said adjusting means has been adjusted and at least one additional member arranged at the base plate operatively associated with said first member for pressing said first member into engagement with said adjusting means; and

a locking collar arranged in said accommodating means for locking said adjusting means at the adjusted position and relative to said base plate, said locking collar being provided with an internal threaded portion and an external threaded portion, said external threaded portion being operable with a threaded portion provided in said accommodating means, and said adjusting means being provided with a threaded portion cooperable with internal threaded portion of said collar.

4,124,975

CALENDAR WATCH

Shinji Morozumi, Hachioji, Japan, assignor to Orient Watch Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1976, Ser. No. 736,219
Claims priority, application Japan, Mar. 4, 1976, 51-25775[U]
Int. Cl.[2] G04B *19/24*
U.S. Cl. 58—58 **4 Claims**

1. A calendar watch comprising a watch case, a dial mounted in the watch case, a date module plate having seven varieties of independent one month date module sections defined on its face at angularly equally spaced separate positions, each of the sections having thirty-one characters representing the dates for one month which are sequentially arranged in seven columns in which the position of the first character is different in turn by one column from each of the other sections, the last column of one date module section being spaced from the first column of the next date module section by a distance greater than the distance between adjacent columns within a date module section, the date module plate being rotatably mounted at the back of the dial in coaxially overlapped relation therewith and adapted to angularly rotate, an exterior manipulator on the watch case operable to angularly rotate the date module plate, a window in the dial for indicating therethrough an aligned selected one of the date module sections, and a sequence of characters representational of the seven days of the week defined on the dial and positioned respectively aligned with the seven columns of each of the date module sections; a date indicator containing circumferentially-spaced successive date characters mounted behind the date module

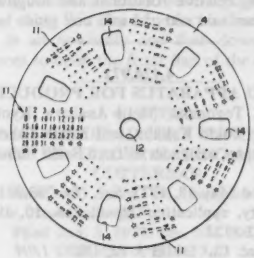


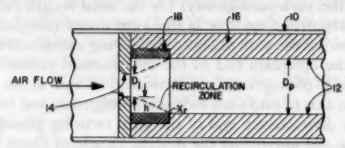
plate in coaxial overlapped relation therewith, a date indicating window formed in the dial, means for rotating the date indicator so that the successive date characters are aligned with said date indicating window, and equally angularly-spaced date windows positioned in the date module plate between adjacent date module sections in such manner that one of the date windows is in alignment with the date indicating window when one of the date module sections is in alignment with the window in the dial.

4,124,976

METHOD FOR REDUCING THE CRITICAL INJECTION PARAMETER IN A SOLID FUEL RAMJET

Allen L. Holzman, Palo Alto, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 702,388, Jul. 6, 1976, abandoned. This application Jul. 5, 1977, Ser. No. 813,044
Int. Cl.[2] F02K *9/04, 9/06*
U.S. Cl. 60—204 **6 Claims**



1. A fuel system for reducing the critical injection parameter h/D_p where $h = \frac{1}{2}(D_p - D_i)$, D_i = diameter of fuel port, D_p = diameter of fuel port in a solid fuel ramjet comprising:

a sustainer fuel within a casing having a central aperture wherein the length of said casing forms a fuel port, and having a recirculation zone adjacent to an injector port within said casing; and

a wedge fuel replacing part of said sustainer fuel in said recirculation zone having a low critical injection parameter (h/D_p) and of sufficient thickness such that when said wedge fuel has been completely burned, said sustainer fuel is above its critical injection parameter to prevent extinguishment, the critical injection parameter (h/D_p) of said sustainer fuel being higher than that of said wedge fuel.

4,124,977

EXHAUST PORT LINER SUPPORT SYSTEM

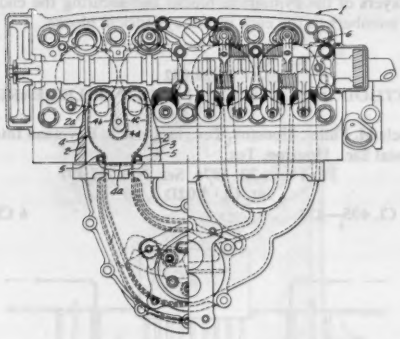
Yoshitoshi Sakurai, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 26, 1976, Ser. No. 718,094

Claims priority, application Japan, Aug. 27, 1975, 75-103069

Int. Cl.[2] F01N *7/08*

U.S. Cl. 60—282 **4 Claims**



1. An engine exhaust port liner system comprising an exhaust port, said exhaust port having first and second exhaust port inlets and a common exhaust port outlet; and an exhaust port liner removably inserted and positioned within said exhaust port so as to provide a clearance around the periphery of said exhaust port liner between said exhaust port and said exhaust port liner except at said first and second exhaust port inlets and said exhaust port outlet, said exhaust port liner having a common exhaust port liner outlet and having a pair of spaced legs each provided with an inlet, said exhaust port liner outlet being slideably secured to said exhaust port outlet, said first and second exhaust port inlets being further defined as each having an exhaust port inlet sidewall, and said exhaust port liner legs being further defined as each having an exhaust port liner inlet side wall which is fitted against said exhaust port inlet sidewalls respectively, so that exhaust port inlet is allowed to thermally expand and contract lengthwise at both said exhaust port inlets and said exhaust port outlet.

4,124,978

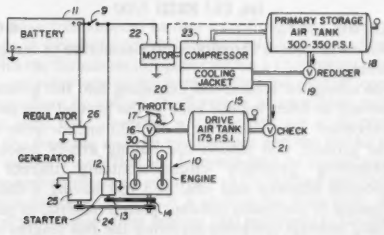
COMPRESSED AIR ENGINE

William C. Wagner, 47 Jamaica Ave., Plainview, N.Y. 11803

Continuation-in-part of Ser. No. 473,420, May 28, 1974, abandoned. This application Aug. 27, 1975, Ser. No. 608,032

Int. Cl.[2] F01B *29/00*

U.S. Cl. 60—410 **13 Claims**



1. A compressed air engine having a source of air under pressure, comprising: an electrically driven compressor for maintaining said pressure above a predetermined level, an air storage tank, means for supplying air from said source to said storage tank to maintain the pressure in said tank at a desired level below said predetermined level, at least one cylinder having a reciprocating piston therein, means for selectively supplying air from said tank to said cylinder to drive said piston, a crank shaft coupled to said piston and rotatably driven responsive to the reciprocating motion of said piston, means coupled to said crank shaft to supply power to said compressor, and further means operative independently of said crank shaft to supply power to said compressor, wherein said means for supplying air to said cylinder comprises: a cylinder head, an auxiliary chamber in said cylinder head, conduit means for connecting said tank to said auxiliary chamber, and input valve means operative to periodically admit air from said auxiliary chamber into the chamber formed by said cylinder head and the top of said piston, the periodicity of said admission of air being synchronized with the rotation of said crank shaft.

4,124,979

INTERNAL COMBUSTION ENGINE WITH EXHAUST GAS TURBO SUPER CHARGER

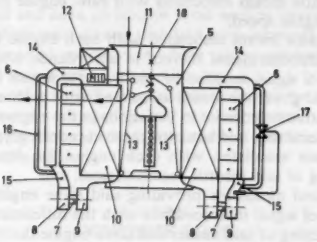
Paul Tholen, Bensberg-Refrath, and Gerhard Finsterwalder, Bensberg, both of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Nov. 29, 1976, Ser. No. 745,879

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1975, 2553821

Int. Cl.[2] F02B *29/04*

U.S. Cl. 60—599 **3 Claims**

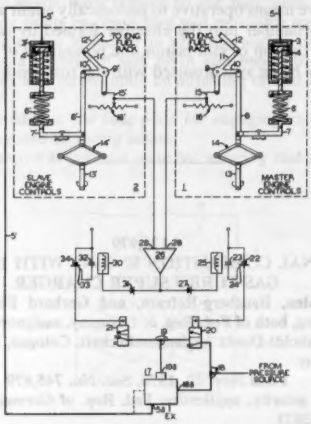


1. An internal combustion engine with exhaust gas turbo super charger means, which includes in combination: air compressor means, exhaust gas conduit means, connecting line means communicating with said exhaust gas conduit means and with said compressor means for conveying in the lower partial load range of the engine exhaust gas from said exhaust gas conduit means to an air charge compressed by said compressor means for purposes of increasing the temperature of said air charge, air charge pressure conduit means, said connecting line means communicating with said air charge pressure conduit means, exhaust gas turbine means, said connecting line means also communicating with said exhaust gas conduit means at a point ahead of said exhaust gas turbine means for conveying in the full load range of said engine a portion of the compressed air charge from said air charge pressure conduit means into said exhaust gas conduit means ahead of said exhaust gas turbine means, air charge cooler means arranged ahead of where said connecting line means leads into said air charge pressure conduit means, and thermostatic control means operatively connected to said air charge cooler means and operable in cooperation therewith to control the air charge in conformity with a predetermined temperature both to improve effeciency and to reduce temperature of exhaust gas when admixed for prewarming the combustion air charge.

4,124,980
MULTI-ENGINE CONTROL SYSTEM PROVIDING EQUALIZED TORQUE FOR DRIVING A COMMON LOAD

Paul E. Olson, and Michael D. Lyons, both of Lexington, Ky., assignors to American Standard Inc., New York, N.Y.

Filed Oct. 14, 1977, Ser. No. 842,181
Int. Cl.[2] F01B *21/00*; F02D *25/02*
U.S. Cl. 60—700 8 Claims

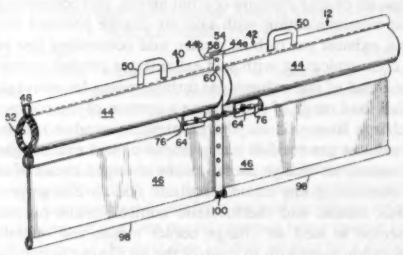


1. A control system for operating a master engine and a slave engine having a common load, said control system comprising:
(a) throttle means associated with eahc engine for varying the engine speed;
(b) actuator means associated with each engine for setting said throttle means thereof in accordance with a speed control signal supplied to said actuator means thereof;
(c) speed governor means associated with each engine and operative responsive to variations in the engine speed for counteracting said actuator means accordingly;
(d) means associated with each engine for detecting the setting of said throttle means thereof; and
(e) control means for providing said slave engine a speed control signal in accordance with the difference between the setting of said master and slave engine throttle means.

4,124,981
FLOTATION MEANS FOR BARRIER FOR WATER CARRIED POLLUTANTS AND METHOD OF MAKING SAME

Paul Preus, 21 Smith Rd., Toms River, N.J. 08753

Filed Sep. 29, 1977, Ser. No. 837,913
Int. Cl.[2] E02B *15/04*
U.S. Cl. 405—66 3 Claims

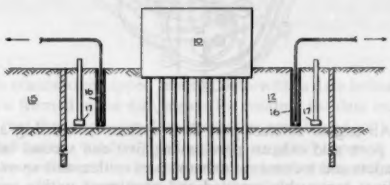


1. A barrier for containing and controlling water carried pollutants comprising a series of boom sections, each boom section comprising a generally tubular portion and a skirt portion, each of the tubular portions containing a flotation material, and means connecting the boom sections in end-to-end relationship, characterized in that the flotation material comprises a plurality of hollow, cylindrical blocks, each of said blocks formed of a plurality of layers of closed-cell foam plastic material, end closure members for each end of each cylindrical block, and adhesive means maintaining the integrity of the layers of the cylindrical blocks and securing the end closure members to the ends of the cylindrical blocks.

4,124,982
METHOD OF STABILIZING SOIL IN PILE BEARING REGIONS

Francis M. Fuller, Houston, Tex., assignor to Raymond International Inc., Houston, Tex.

Filed Sep. 22, 1976, Ser. No. 725,497
Int. Cl.[2] E02D *3/10*
U.S. Cl. 405—232 6 Claims



1. A method of stabilizing loose, water-bearing, granular soil having liquefaction potential in a pile bearing region, comprising: placing load support pile means in said region of soil to a depth at least to a load bearing level and at least equal to the depth of said soil having liquefaction potential, forming endless wall means in said region and to a depth at least equal to the depth of said soil having liquefaction potential to confine said region above said load bearing level and within said wall means and to resist the flow of ground water into said region, providing means for removing water from within the confines of said wall means and removing water from within the confines of said wall means substantially to dewater said soil to a degree sufficient to stabilize said soil having liquefaction potential to thereby provide additional support for said load bearing piles.

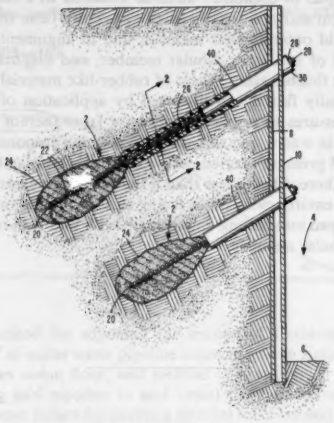
4,124,983
CORROSION PROTECTED EARTH TIEBACK

David E. Weatherby, Rockville, Md., assignor to Schnabel Foundation Company, Washington, D.C.

Filed Dec. 27, 1976, Ser. No. 754,515
Int. Cl.[2] E02D *5/00*
U.S. Cl. 405—260 6 Claims

1. An earth tieback for anchoring a structure to the ground comprising
(a) an elongated tendon rod extending into the ground and having an inner anchor zone in the ground and an outer unbonded zone extending from said anchor zone out of the ground, said tendon rod having axially spaced ribs extending generally circumferentially thereof with grooves between said ribs, said rod having a thin hard coating of corrosion resistant plastic material of substantially uniform thickness covering the full lengths of said anchor zone and said unbonded zone;
(b) means for securing the outer end of said tendon rod to the structure to be supported;
(c) a grout anchor embedded within the ground in contact with and covering the full length of said anchor zone only of said coated tendon rod in bonded relation thereto;
(d) a plastic tube in contact with and covering said coated tendon rod over the full length of said unbonded zone

only, said tube having a heat shrinkable outer layer and thermoplastic adhesive inner lining, said tube having said outer layer heat shrunk tightly about said tendon rod with said adhesive inner lining in contact with and snugly encasing said coated tendon rod in substantially void-free relation thereto, said outer layer having an undulating



outer surface generally conforming to said ribs and said adhesive lining completely encasing said ribs and said grooves, whereby said tendon rod is doubly protected from corrosion in said anchor zone by said coating and said grout anchor and in said unbonded zone by said coating and said adhesively lined tube.

4,124,984

MINE ROOF SUPPORTS

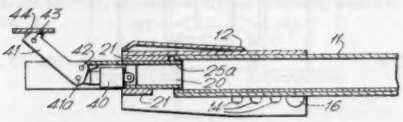
Graham J. Saunders, Newcastle upon Tyne, England, assignor to Huwood Limited, Durham, England

Filed Sep. 23, 1977, Ser. No. 835,889

Claims priority, application United Kingdom, Sep. 24, 1976, 39650/76

Int. Cl.² E21D *17/02*

U.S. Cl. 405—293 **6 Claims**



1. A mine roof support having a roof engaging cover and a forepole, in which the cover is formed by a leading and trailing part with the former recipropable within a continuous range of movement relatively to the latter so that the overall length of the cover may be varied, the forepole is associated with the leading part, fluid operated piston means are connected between the forepole and the trailing part and the stroke of the piston means is such that the forepole may be reciprocated in the fore-and-aft direction relatively to the trailing part through a continuous range of which a section lies forwardly of the range of movement of the leading part relatively to the trailing part, abutment surfaces provided by the leading part and the forepole co-operate when the leading part is retracted and the forepole reaches the forward end at the forwardly lying section so that further forward movement of the forepole results in corresponding forward movement of the leading part, and further abutment surfaces provided by the leading part and the forepole co-operate when the leading part is extended relatively to the trailing part and the forepole reaches the rearward end of the forwardly lying section so that further rearward movement of the forepole results in corresponding rearward movement of the leading part.

4,124,985

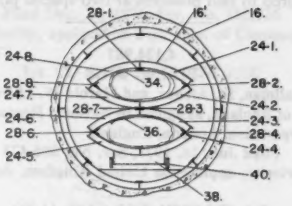
COLLAPSIBLE TUNNEL LINER SECTION AND METHOD OF LINING A TUNNEL

Lembit Maimets, 39 Rivercourt Blvd., Toronto, Ontario, Canada (M4J 3A3)

Filed Sep. 28, 1977, Ser. No. 837,112

Int. Cl.² E21D *5/00*; E01G *5/16*

U.S. Cl. 405—150 **11 Claims**



1. A collapsible concrete tunnel liner section comprising:

(a) at least six arcuate concrete segments forming, when erected, a closed loop tunnel liner section of predetermined inner diameter,

(b) hinge means hingedly connecting said segments together for movement from a collapsed condition in which said segments are arranged in a compact closed loop stack having an external cross section less in its maximum dimension than said predetermined diameter, through an intermediate position in which said segments are partly erected and have an interior cross section having a maximum dimension greater than said predetermined diameter, to an erected condition in which said segments form said closed loop tunnel liner section, and

(c) expandable air bag means within said stack for expanding and thereby expanding said stack from said collapsed condition through said intermediate condition to said erected condition.

4,124,986

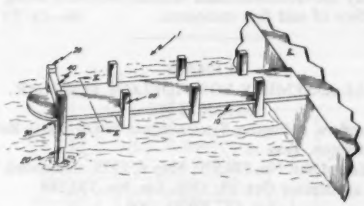
CONCRETE DOCK

Randall F. Postma, 2570 Sun Valley, Jenison, Mich.

Filed Mar. 28, 1977, Ser. No. 781,787

Int. Cl.² E02B *3/20*; B63B *35/00*

U.S. Cl. 405—212 **37 Claims**



1. A dock comprising: an elongated, precast concrete platform having a generally flat upper surface to provide a suitable walking surface; support means operably connected to one end of said platform for supporting same; piling means operably supporting the other end of said platform and extending downwardly into the water and into the ground below the water; at least one bumper leg operably connected to each side of said platform spaced from either end and said piling and said support means, said bumper leg extending a short distance above and below said platform, but not to the water line beneath said platform; each side of said platform including a notch in the

side edge thereof receiving said bumper leg, said leg being wider in cross section than the depth of said notch whereby each of said bumper legs projects laterally beyond the side edges of said platform; each of said bumper legs being made of a material more resilient and less abrasive than concrete whereby there is less damage to a boat bumping said bumper member legs than would be the case if a boat bumped said precast concrete platform; said precast concrete platform including at least one integrally formed rib projecting downwardly therefrom and extending longitudinally thereof; each said bumper leg being operably connected to said platform along each side thereof and to said rib whereby said leg is rigidly secured to said platform at two spaced points.

4,124,987

PILING RIGS

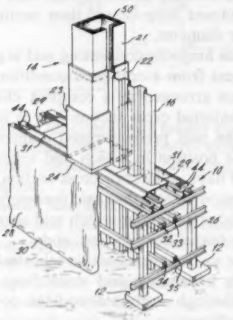
Philip J. Hallman, St. Albans, and Harold W. Lawrence, Bromley, both of England, assignors to National Research Development Corporation, London, England

Filed Jun. 14, 1977, Ser. No. 806,473

Claims priority, application United Kingdom, Jun. 16, 1976, 24944/76

Int. Cl.[2] E02D *7/02;* **G10K** *11/00*

U.S. Cl. 405—276 **9 Claims**



1. For use in a piling process, a rig comprising a first sound-reducing pile enclosure of generally elongate shape with its length disposed horizontally, an upper surface to said first enclosure defining a pile-accepting aperture, a second sound-reducing enclosure having a pile-accepting aperture at the bottom thereof, and mounting means for mounting said second enclosure over said first enclosure, said mounting means being horizontally movable with said second enclosure along said upper surface of said first enclosure.

4,124,988

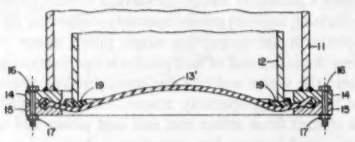
SEAL ASSEMBLY FOR HOLLOW TUBULAR STRUCTURE

Don B. Landers, Arlington, Tex., assignor to Oil States Rubber Co., Arlington, Tex.

Continuation of Ser. No. 574,920, May 6, 1975, abandoned. This application Oct. 18, 1976, Ser. No. 733,249

Int. Cl.[2] E02D *5/00*

U.S. Cl. 405—228 **2 Claims**



1. In combination with a water immersible hollow tubular structure such as an underwater piling guide and the like a seal assembly comprising, inner and outer concentric hollow tubular members; a circular elastic diaphragm, clamping means attached to said outer tubular member for holding said diaphragm to cover and seal an end of said outer tubular member from environment external of said outer tubular member; an annular pad of elastomer material attached to a face of said diaphragm and positioned radially inwardly from the perimeter of said outer tubular member, and in alignment with the wall end of said inner tubular member; said diaphragm comprising a flexible elastic sheet of rubber-like material of a type substantially flexed and distorted by application of different fluid pressures to respective opposite faces thereof upon immersion in water; and said diaphragm being responsive solely to a fluid pressure exerted on the inner tubular member facing surface thereof being less than a fluid pressure exerted on the external environment water facing surface thereof to urge said annular pad into sealing engagement with said wall end of said inner tubular member.

4,124,989

SUPPORTS FOR MARITIME STRUCTURES

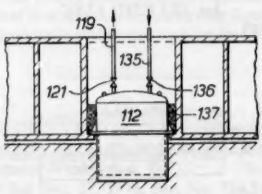
Donald M. Watson, Leven, Scotland, and Vladimir Nastasic, Zapresic, Yugoslavia, assignors to Redpath Dorman Long (North Sea) Limited, Bedford, England

Filed Jun. 4, 1976, Ser. No. 692,733

Claims priority, application United Kingdom, Jun. 4, 1975, 24139/75

Int. Cl.[2] E02D *27/52*

U.S. Cl. 405—225 **7 Claims**



1. In a foundation raft for a free-standing maritime platform, the raft including a horizontal base slab from which depends a plurality of shear key units adapted to engage and penetrate a subaqueous bed, an improved shear key unit comprising:

a fluid tight cylinder having a distal end open to pressure from the subaqueous bed;

means for charging the interior of the cylinder with a liquid;

means for selectively and controllably enabling the exhausting of liquid from the interior of the cylinder to ambient;

said cylinder being a separate assembly from the slab;

said slab including open cells for accommodating and supporting each of the shear key units, each cell extending through the slab and being dimensioned so that a cylinder assembly can be lowered into the respective cell from the top of the slab; and

means for rigily securing each respective cylinder to the slab while it is within a cell and extends below the slab a predetermined amount.

4,124,990

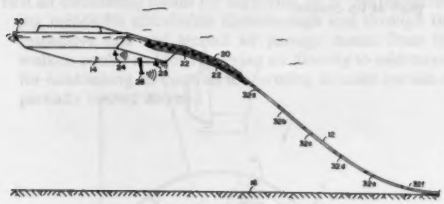
METHOD AND APPARATUS FOR ADJUSTING THE TENSION OF AN UNDERWATER PIPELINE

Duncan Bell, Stanwood; Jack L. Odell; David E. Olson, both of Everett, and Allen E. Peirce, Lynnwood, all of Wash., assignors to Western Gear Corporation, Everett, Wash.

Division of Ser. No. 623,584, Oct. 20, 1975, Pat. No. 4,037,189. This application Jun. 9, 1977, Ser. No. 805,076

Int. Cl.[2] F16L *1/00*

U.S. Cl. 405—167 4 Claims



1. A method for adjusting the tension of a non-supported portion of an underwater pipeline extending from a pipe laying vessel to an ocean floor, said method comprising:

securing said pipeline to said vessel through variable pipe tensioner means for exerting an axial force on said pipeline having a magnitude determined by a pipe tensioning signal;

determining the profile of the non-supported portion of said pipeline between said vessel and said ocean floor in a plane of reference;

analyzing said profile to determine the minimum bending radius of said portion;

and producing a pipe tensioning signal for the tensioner means indicative of said minimum bending radius to vary the tension of said pipeline thereby maintaining said minimum bending radius above a predetermined value.

4,124,991

OFFSHORE PIPE LAYING

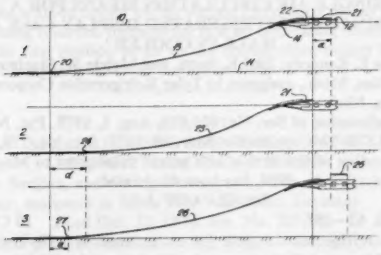
Walter M. Adler, The Hague, Netherlands, assignor to Viking Jersey Equipment Ltd., St. Helier, Channel Islands

Filed Jun. 13, 1977, Ser. No. 806,287

Claims priority, application United Kingdom, Jun. 14, 1976, 24578/76

Int. Cl.[2] F16L *1/00*

U.S. Cl. 405—166 4 Claims



1. A method of laying an offshore pipe line using a pipe laying vessel and including repeated steps of launching a length of pipe from the vessel at a speed greater than the speed of forward movement of the pipe laying vessel during pipe laying operation while allowing pipe tension to drop between predetermined safe limits, wherein for each step of launching a length of pipe, the vessel is moved forward to raise pipe tension again towards its upper limit at least partly while a further length of pipe is being welded to the end of the assembled pipe line on the vessel.

4,124,992

METHOD AND APPARATUS FOR THE DEEP COOLING OF LIQUID BIOLOGICAL SUBSTANCES

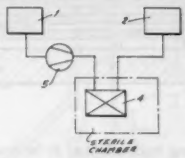
Horst Chmiel, Leonberg, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Dec. 21, 1976, Ser. No. 752,836

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1975, 2557871

Int. Cl.[2] C12B *3/00;* F25C *1/00*

U.S. Cl. 62—74 13 Claims



1. A process for mixing a liquid biological substance such as blood, blood components and cell suspensions, with a liquid protective agent stabilizing the biological substance for subsequent deep freezing, said process comprising the steps of:

atomizing said protecting agent in an atomized stream;

dripping the biological substance in droplets into said stream, thereby mixing the biological substance with the protective agent and forming a mixture thereof; and

collecting said mixture in a container.

4,124,993

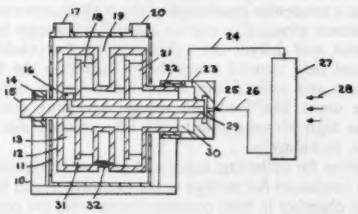
REFRIGERATION MACHINE

Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042

Continuation-in-part of Ser. No. 595,389, Jul. 14, 1975, Pat. No. 4,044,824, and a continuation-in-part of Ser. No. 825,701, Aug. 18, 1977. This application Aug. 26, 1977, Ser. No. 827,943

Int. Cl.[2] F25B *9/00*

U.S. Cl. 62—86 2 Claims



1. A thermodynamic method comprising:

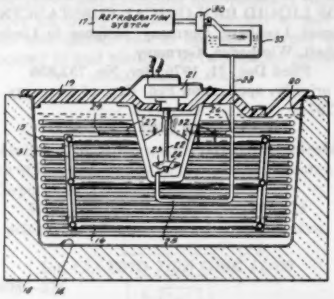
a. passing a fluid through a pressure reducing expansion valve;

b. subsequently vaporizing said fluid in a continuously rotating evaporator-compressor comprising alternate compression-expansion steps with simultaneous addition of heat and accompanying pressure increase.

4,124,994
BEVERAGE COOLING BATH

Richard T. Cornelius, Minnetonka, and Charles G. Erickson, Anoka, both of Minn., assignors to McQuay-Perfex Inc., Minneapolis, Minn.

Filed Jun. 29, 1977, Ser. No. 811,261
Int. Cl.[2] F25C 1/08
U.S. Cl. 62—138 18 Claims



1. A beverage cooling bath adapted to be cooled by a refrigeration system, comprising:

(a) a thermally insulated water tank;

(b) an evaporator adapted to be a part of the refrigeration system and supported to be in heat-transfer relation to water in said tank for freezing ice thereon;

(c) a motor driven water impeller supported in said tank;

(d) a tube having an inlet end supported in confronting relation to said impeller for receiving a flow of water therefrom, and having an outlet directed along the freezing surface of said evaporator, said tube having a branch connected thereto in spaced relation to said outlet; and

(e) means connected to said branch and responsive to blockage of flow through said outlet due to the formation of ice between said branch and said outlet, and adapted to be connected to deenergize the refrigeration system.

4,124,995
EXPANSION DEVICE

William J. Lavigne, Jr., Fayetteville; William Agley, Syracuse, and George M. Case, Kirkville, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 17, 1976, Ser. No. 742,716
Int. Cl.[2] F25B 41/04; F16K 15/00, 17/00, 21/04
U.S. Cl. 62—224 6 Claims

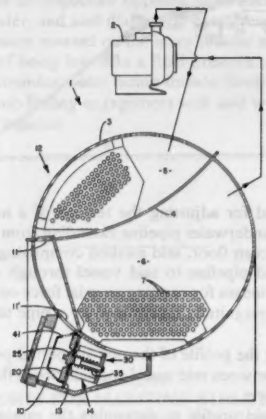
1. In a refrigeration machine having a high pressure side and a low pressure side, an evaporator positioned on the low pressure side, a condenser positioned on the high pressure side, and a compressor arranged to extract gaseous refrigerant from the evaporator and deliver the refrigerant to the condenser, a refrigerant flow control assembly for metering the flow of refrigerant and maintaining a minimum system differential pressure under low load and normal operating conditions, from the high pressure side to the low pressure side of the machine, including

a receiver for collecting liquid and gaseous refrigerant from the condenser for passage to the evaporator, and having a first chamber in fluid communication with the condenser and a second chamber, separated from the first chamber by a barrier, in fluid communication with the evaporator,

a vaive plate defining a circular port for the flow of refrigerant therethrough from the first chamber of the receiver to the second chamber of the receiver, and wherein the circular port is positioned so that liquid refrigerant passes therethrough at both low load and normal operating conditions,

a valve plug having a right conical surface at one end for operative communication with said circular port to regulate the refrigerant flow therethrough to maintain a minimum pressure differential between the high pressure side and low pressure side of the machine, and a stem at the other end,

valve plug mounting means operatively connected to said valve plate for slidably mounting said valve plug for translational movement between a closed position and an open position in relation to said circular port, along a line coincident with the axis of said valve plug, which line is perpendicular to and intersects the plane of said circular port at its center,



stop means to retain the valve plug in a spaced relation to the circular port when the valve plug is in the closed position thereby creating a predetermined annular port area for the flow therethrough of refrigerant under low load conditions, and

a resilient member operatively disposed between said valve plug and said valve plug mounting means, the line of action of said resilient member being substantially coincident with the axis of said valve plug, for biasing said valve plug between the closed and open positions in response to low load operating conditions and normal operating conditions of the refrigeration machine.

4,124,996
REFRIGERATION SYSTEM INCORPORATING A SINGLE AIR CIRCULATION MEANS FOR A COMBINATION REFRIGERATED DISPLAY CASE AND WALK-IN COOLER

Thomas E. Kennedy; Earl E. Butts, and Melvin W. Steelman, all of Niles, Mich., assignors to Tyler Refrigeration Corporation, Niles, Mich.

Continuation of Ser. No. 601,576, Aug. 1, 1975, Pat. No. 4,023,378. This application Mar. 16, 1977, Ser. No. 778,236
The portion of the term of this patent subsequent to May 17, 1994, has been disclaimed.
Int. Cl.[2] A47F 3/04
U.S. Cl. 62—256 10 Claims

1. A refrigeration system for a combination walk-in cooler and refrigerated display case, the display case having an access opening at the front thereof for unimpeded access to the product therein, the system comprising:

means for refrigerating the walk-in cooler and the refrigerated display case,

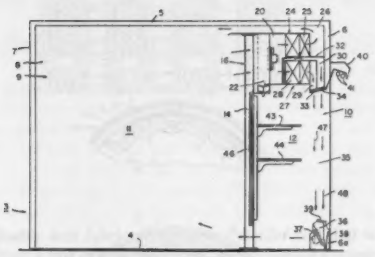
means for establishing a plurality of air curtains extending substantially vertically across the access opening in front of the refrigerated display case serving to oppose the passage of ambient air through the access opening into the refrigerated display case, said means establishing at least

an inner curtain of cooled air and an outer curtain of partially cooled air,

first air passage means associated with the refrigerating means for carrying refrigerated air therefrom to the walk-in cooler portion of the combination,

second air passage means associated with the refrigerating means for carrying refrigerated air to the access opening of the display case and to said means for establishing air curtains, whereby said second air passage means forms at least said inner curtain of cooled air with the refrigerated air from said refrigerating means,

first air circulating means for supplying air to the refrigerating means for circulation therethrough and through the respective first and second air passage means from the walk-in cooler and for supplying air directly to said means for establishing air curtains for forming an outer curtain of partially cooled air, and



second air circulating means for circulating air passing through the air curtains from said display case, to the walk-in cooler portion of said combination,

whereby the refrigerating means cools a first portion of air to one lower temperature, the first portion of air being carried by the first passage means into the walk-in cooler portion of the combination, and the refrigerating means cools a second portion of the air to a second lower temperature, the second portion of air being carried by the second passage means to the air curtain forming means, then utilized with a third portion of air circulated by the first air circulating means to form air curtains across the access opening in the front of the refrigerated display case, the second and third portions of air being circulated through the walk-in cooler by the second circulating means before being returned through the first air circulating means with the first portion of air to the refrigerating means for recooling said first and second portions of air.

4,124,997

APPARATUS FOR THE COOLING AND EMBRITTLEMENT OF TIRES

Heinz Sadjina, and Georg Veranneman, both of Pullach, Germany, assignors to Linde AG, Wiesbaden, Germany

Filed Oct. 22, 1976, Ser. No. 735,005

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1975, 2547521

Int. Cl.² F25C *5/02*

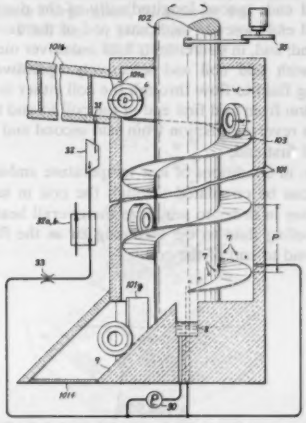
U.S. Cl. 62—320 **5 Claims**

1. An apparatus for the cooling and comminution of vehicle tires of a size range having a certain largest tire size, comprising:

an upright cylindrical cooling shaft having an inlet for said tires at an upper end and an outlet for said tires at the lower end;

a column disposed centrally in said shaft and coaxial therewith, said shaft having an inner wall spaced from said column with an all-around clearance;

a helical ramp extending around said column between said column and said inner wall of said shaft from said inlet to said outlet for passing said tires downwardly in successive turns around said column to said outlet, said ramp having a substantially fixed orientation relating to said inlet and outlet, the width of said ramp being slightly greater than the width of the largest of said tires to be embrittled, the



pitch of said ramp being at least equal to the diameter of the largest of said tires to be embrittled and the pitch angle of said ramp being such that said tires pass downwardly therealong under their own weight; and

means including a nozzle system flanking said ramp over the lower third of the shaft for directing jets of liquefied gas against the side walls of said tires for subjecting said tires on said ramp to contact with a cooling fluid and embrittlement of the tires.

4,124,998

AIR CONDITIONING SYSTEMS FOR BUILDINGS

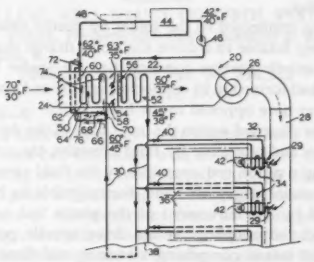
Kazimierz Swiderski, Don Mills, Canada, assignor to Canada Square Management Ltd., Toronto, Canada

Filed Jan. 24, 1977, Ser. No. 762,074

Claims priority, application Canada, Feb. 3, 1976, 244860

Int. Cl.² F25D *13/02;* **F25B** *7/00*

U.S. Cl. 62—442 **5 Claims**



1. An air conditioning system for a building having a building cooling load, the system including:

a cooling circuit for a cooling fluid, the building cooling load being connected in said circuit and the circuit including: means for circulating the cooling fluid unidirectionally in the circuit and through the building cooling load; and means for cooling the fluid; and,

means for delivering fresh air to the building, said means

including: an inlet duct having an outer end communicating with ambient air outside the building; and means for drawing air into the building through the duct;

the cooling circuit further including: a heat transfer coil connected in said circuit upstream of the cooling means and defining a fluid flow path for said cooling fluid, the coil being arranged in said fresh air inlet duct so as to allow heat energy transfer between air in the duct and fluid in said coil, and the coil having respective first and second ends spaced longitudinally of the duct with said second end closer to said outer end of the duct than said first end; and, in said circuit, fluid crossover means associated with said coil and selectively operative to cause cooling fluid to flow through the coil either in a forward direction from said first end of the coil to said second end or in a reverse direction from said second end of the coil to said first end;

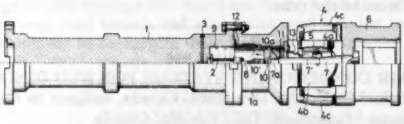
whereby, in conditions of low temperature ambient air, the fluid can be circulated through the coil in said reverse direction in order to minimize the overall heat loss from the cooling fluid to the incoming air as the fluid travels from end to end of the coil.

4,124,999

SUPPORT ASSEMBLY FOR COUPLING OF UNIVERSAL JOINT

Tetsuo Hirasawatsu, Kashiwarashi, and Takashi Matsueda, Nonichimachi, both of Japan, assignors to Koyo Seiko Company Limited, Osaka, Japan

Filed Jul. 21, 1977, Ser. No. 817,669
Int. Cl.[2] F16D *3/76, 3/26*
U.S. Cl. 64—17 R **3 Claims**



1. A support assembly for the coupling of a universal joint comprising:

a spider having a hole of large diameter extending through its center,

a coupling connected to the spider by needle cases and detachably fittable to a drive shaft or a driven shaft,

a drive spindle portion connected to the spider by needle cases and formed in its connected spindle end portion with an inner bore opposed to the hole,

a cylinder disposed within the inner bore of the drive spindle portion and operative by fluid pressure, the cylinder including a piston rod operative by the fluid pressure, and

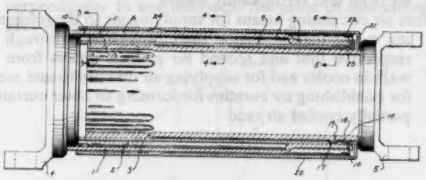
support means engageable and disengageable by being controlled by the movement of the piston rod to securely support the coupling on the drive spindle portion, the support means comprising a locking rod fixed to either one of the coupling and the piston rod and extending through the hole with a sufficient radial clearance formed between the rod and the inner periphery of the spider defining the hole and a rod receiving member provided on the other of the coupling and the piston rod and engageable with and disengageable from the free end of the locking rod, the coupling being securely supportable on the drive shaft portion by the engagement between the free end of the locking rod and the rod receiving member.

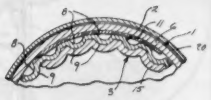
4,125,000

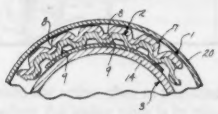
TELESCOPIC TUBULAR POWER TRANSMITTING UNIT

Benjamin Grob, Cedarburg, Wis., assignor to Grob, Inc., Grafton, Wis.

Filed Dec. 14, 1976, Ser. No. 751,047
Int. Cl.[2] F16L *27/12;* F16D *3/06*
U.S. Cl. 64—23 **11 Claims**







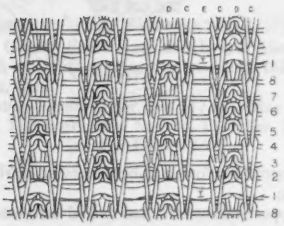
1. A telescopic power transmitting unit, comprising a tubular inner member having a generally cylindrical axial outer section and having an externally splined axial inner section disposed axially inward of said cylindrical section, a central member disposed radially outward of said inner member and having an internal spline and an external spline, said splines extending substantially the full length of said central member and said internal spline engaged with the splined section of the inner member, an outer member disposed radially outward of the inner member, an outer member disposed radially radially outward of said central member and having a generally cylindrical axial outer section and an internally splined axial inner section disposed axially inward of said last named cylindrical section and engaged with the external spline of the central member, said inner and outer members each being mounted for telescopic sliding movement with respect to the central member between retracted and extended positions, first universal coupling means connected to the outer end of the inner member, second universal coupling means secured to the outer end of the outer member, first guide means disposed between the cylindrical section of the inner member and the central member for guiding the cylindrical section of the inner member in sliding movement, first stop means for limiting axial outward telescopic movement of the inner member in said extended position whereat the splined section of the inner member is disposed wholly within the central member, second guide means disposed between the cylindrical section of the outer member and the central member for guiding the cylindrical section of the outer member in sliding movement, and second stop means for limiting axial outward telescopic movement of the outer member.

4,125,001

MULTI-GAUGE KNIT FABRIC WITH INLAY

David J. J. Bryars, Leicestershire, England, assignor to Austen Bryars of London, Inc., Greensboro, N.C.

Division of Ser. No. 640,945, Dec. 5, 1975, Pat. No. 4,043,152.
This application Aug. 19, 1977, Ser. No. 826,059
Int. Cl.[2] D04B *1/04*
U.S. Cl. 66—9 R 1 Claim



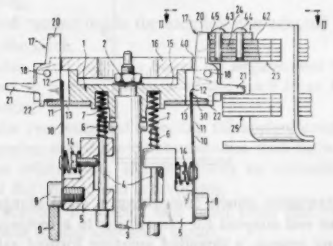
1. A double knit fabric comprising cylinder and dial wales fromed from a fine denier body yarn and including a relatively heavy denier inlay yarn attached with stitches to only one surface of the fabric wherein said inlay yarn stitches are inter-engaged with stitches of said body yarn only on alternate wales of the same course and on consecutive courses of the same wale and wherein every fourth consecutive cylinder and dial wale is non-knit.

4,125,002

PATTERNING DEVICE FOR A MANUAL KNITTING MACHINE

Dieter Steinhof, Bismarckstr. 28, 8135 Söcking, and Winfried Krämer, Koslinerstr. 5a, 1000 Berlin, both of Fed. Rep. of Germany

Filed Sep. 13, 1977, Ser. No. 832,985
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1976, 2641151
Int. Cl.[2] D04B *7/00, 15/66*
U.S. Cl. 66—75.2 6 Claims



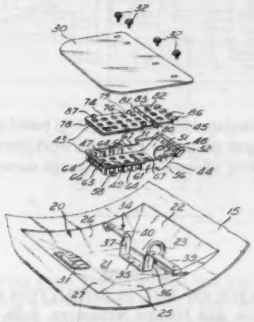
1. A patterning device for a manual knitting machine having a patterning wheel which is dependent upon the sliding movement thereof and whose rotation is synchronised via drag links or the like having patterning teeth with the movement of a selection disc, a switching magnet for activating the selection disc, drop shoes influenced by the switching magnet via leaf spring components for controlling the drag links or the like, characterised in that the leaf spring components include free ends arranged to be brought from their latching position into the operating position by means of levers or the like moved by the switching magnet.

4,125,003

SUMP STRAINER FOR TUMBLER WASHING MACHINE

William A. Wasemann, Mansfield, Ohio, assignor to White-Westinghouse Corporation, Pittsburgh, Pa.

Filed Sep. 9, 1976, Ser. No. 721,707
Int. Cl.[2] D06F *39/08*
U.S. Cl. 68—208 4 Claims



1. A laundry appliance having a non-rotatable tub, means defining a sump portion of the tub, a pump, a drain conduit having an inlet at the wall of said sump and connected to said pump, a strainer box to prevent articles from entering the pump through said drain conduit, and bracket means mounting said strainer box in said sump, wherein the improvement comprises said strainer box having an end with an aperture therethrough constructed and arranged to sealingly connect said drain conduit inlet to said strainer box, said box having perforated openings in its top wall, sidewalls and bottom wall, lug means constructed and arranged to space said sidewalls and bottom wall from corresponding walls of said sump into which said strainer box is located, said strainer box having notch means in cooperative engagement with said bracket means fixedly positioning said box in said sump and urging said box into sealing engagement with said drain conduit inlet.

4,125,004

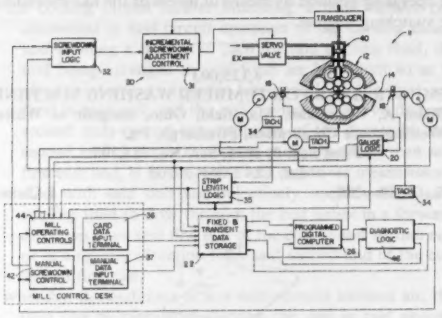
ROLLING MILL GAUGE CONTROL SYSTEM

Thomas J. Alshuk, Wethersfield, Conn., assignor to Amtel, Inc., Providence, R.I.

Filed Jul. 12, 1977, Ser. No. 814,932
Int. Cl.[2] B21B *37/00*
U.S. Cl. 72—9 14 Claims

1. A feed backward gauge control system for a rolling mill having at least one mill stand with an adjustable screwdown for controlling the roll opening thereof through which a sheet metal workpiece is fed during a rolling mill run for reducing the thickness of the workpiece from an input gauge to an output gauge, screwdown adjustment means for adjusting the mill stand screwdown and to thereby adjust the roll opening and workpiece output gauge, means for measuring the output gauge (G_O) of the sheet metal workpiece; and computing means employing a predetermined mill screwdown adjustment model for determining any corrective screwdown adjustment for achieving a desired output gauge using rolling mill running variables consisting essentially of the measured output gauge (G_O) and an unmeasured simulated input gauge (G_{CI}), the screwdown adjustment means being connected to be operated by the computing means for adjusting the mill screwdown in

accordance with said computed corrective screwdown adjustment, and the computing means being operable for adaptively



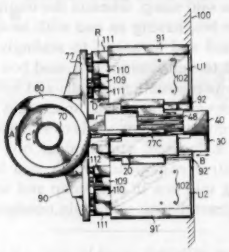
adjusting said simulated input gauge (G_{CI}) based at least in part on a nominal input gauge (G_{NI}) of the workpiece and empirically on a plurality of spaced output gauge measurements.

4,125,005

LOCK DEVICE OF THE PUSHBUTTON SYSTEM

Katori Nakamura, and Hisako Nakamura, both of No. 18-17 Okuzawa 6-chome, Setagaya-Ku, Tokyo, Japan

Filed Jun. 22, 1977, Ser. No. 809,039
Claims priority, application Japan, Dec. 2, 1976, 51-144895
Int. Cl.[2] E05B *37/16*
U.S. Cl. 70—133 **10 Claims**



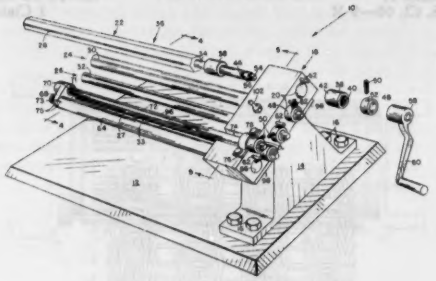
1. A lock device of the pushbutton system comprising:
at least one lock unit adapted to permit a locking and unlocking bar to rotate when pushbuttons of a number *r* out of a total number *n* are depressed in a manner to meet the requirements for rendering the lock unit inoperative to fasten a door;
a restoring mechanism for returning the lock unit to a standby position;
a locking and unlocking pawl coupled to the locking and unlocking bar of the lock unit;
a dead bolt engaged with said locking and unlocking pawl;
a dead bolt operating mechanism operative to permit the dead bolt for fastening the door to be operated by turning one of two grips of the door so long as the aforesaid requirements for rendering the lock unit inoperative to fasten the door are met, said dead bolt operating mechanism comprises a control slider located in said dead bolt for sliding movement axially thereof, an intermediate slider held in engagement with said control slider, and means for moving said intermediate slider as one of the two grips of the door is operated.

4,125,006

SHEET METAL FORMER

Clifford J. Bueche', P.O. Box 14426, San Antonio, Tex. 78214

Filed Aug. 19, 1977, Ser. No. 826,274
Int. Cl.[2] B21D *5/14*
U.S. Cl. 72—169 **9 Claims**



1. An apparatus for forming sheet metal comprising:
base means;
bearing support means attached to said base means;
plurality of roller means being rotatably anchored near a first end thereof by said bearing support means, said first end extending through said bearing support means, a second end of said roller means being open;
slot means in said roller means extending along its longitudinal axis from said second end for receiving said sheet metal therein;
said plurality of roller means being arranged, one to the other, to enable a first of said roller means to serve as stop means for sheet metal inserted within a second of said roller means adjacent thereto, said sheet metal being bent upon said first roller means;
handle means connected to said roller means for rotating said roller means to form said sheet metal thereon, formed sheet metal being slideably removed off said second end.

4,125,007

PUNCH AND METHOD OF CONSTRUCTION

Joseph B. Huber, Acme, and Andrew M. Marcinko, Mount Pleasant, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Continuation of Ser. No. 725,186, Sep. 21, 1976, abandoned. This application Oct. 31, 1977, Ser. No. 847,171
Int. Cl.[2] B21C *25/06*
U.S. Cl. 72—273 **3 Claims**

1. An extrusion punch comprising; a rigid elongate body having one end adapted for connection to a reciprocal force transmitting source, a threaded aperture formed axially into the other end of said body; an end cap formed of a cemented hard metal carbide having a working region facing away from said body and having an annular abutment region facing said body for abutment with said other end of said body; a reduced diameter portion on said end cap extending into said threaded aperture and tapering outwardly away from said end cap; an internally threaded two part split ring element mating with the

threads of said aperture and tapered internally for mating with said tapered reduced diameter portion of said end cap, and radially inwardly and outwardly facing mating axial flats formed respectively on the inside of said split ring and on the periphery of said reduced diameter portion of said end cap so as to prevent rotation of said split ring element on said reduced diameter portion of said end cap.

4,125,008

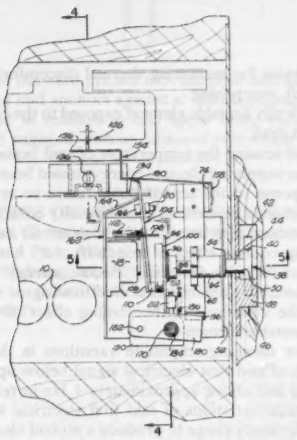
ELECTRICALLY OPERATED LOCK

Leonard J. Genest, Santa Ana, and Daryle Messner, Buena Park, both of Calif., assignors to Monitron Industries, Inc., Santa Ana, Calif.

Continuation-in-part of Ser. No. 577,124, May 13, 1975, abandoned. This application Nov. 13, 1975, Ser. No. 631,554

Int. Cl.[2] E05B *47/00*

U.S. Cl. 70—279 **10 Claims**



1. An electric lock, said lock being operable in response to a combination applied to said lock by insertion into the lock of a card carrying the combination, comprising:

a lock housing;

a rotatable latch protruding from the lock housing and adapted to engage a keeper mounted adjacent the lock housing;

a toothed ratchet inside the lock housing adapted to rotate with the latch;

retractable pawl normally biased for engagement with said ratchet to prevent rotation of the latch in at least one direction;

means for receiving and detecting the applied combination, comparing said detected combination with stored combination information, and generating an activation signal when the comparison is favorable;

means adapted to retract said pawl from said ratchet in response to said activation signal;

means for maintaining said pawl in a retracted position as long as a card bearing a code generating a favorable comparison remains inserted into the lock;

means for terminating operation of the retracting means after the pawl is retracted; and,

an energy source connected to supply the power requirements of said lock.

4,125,009

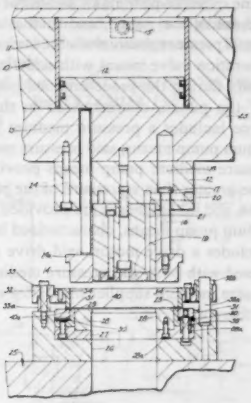
BLANK AND DRAW APPARATUS WITH GAP CONTROL

James I. Byrd, and Elton G. Kaminski, both of Sidney, Ohio, assignors to The Stolle Corporation, Sidney, Ohio

Filed Apr. 28, 1977, Ser. No. 791,859

Int. Cl.[2] B21D *22/00*

U.S. Cl. 72—350 **7 Claims**



1. In a drawing press having a fixed bed and a reciprocable ram, for drawing a metallic blank into a cup, said bed carrying a draw die and said ram carrying a draw punch, a pressure pad carried by said ram and urged against said draw die to clamp the edge of said blank during the draw, means establishing a predetermined gap between said pressure pad and draw die in relation to the thickness of said blank, comprising an annular flange on said pressure pad and an abutment in said bed to limit the movement of said pressure pad upon movement of said ram to provide said predetermined gap, and means to maintain a constant pressure on said pressure pad during the draw.

4,125,010

HYDRAULIC PRESS

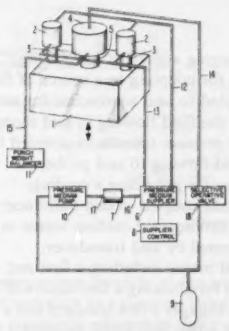
Klaus Adam, Waghäusel, Fed. Rep. of Germany, assignor to SMG-Süddeutsche Maschinenbau GmbH, Fed. Rep. of Germany

Filed Feb. 28, 1977, Ser. No. 772,765

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1976, 2607762

Int. Cl.[2] B21J *9/12*

U.S. Cl. 72—453.06 **12 Claims**



1. A hydraulic press which includes a punch, and at least one cylinder piston unit means for selectively displacing the punch, characterized in that at least one action stroke pressure means

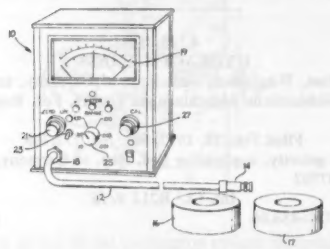
is operatively connected to the punch for acting upon the punch in an action stroke direction, and means are provided for controlling the operation of said action stroke pressure means so as to render said action stroke pressure means effective only during a predetermined portion of the displacement of the punch in the action stroke direction, characterized in that a pressure medium supplier means is operatively connected with said at least one cylinder piston unit means for causing a selective displacement of the punch, and in that said controlling means includes a pressure medium source connected by way of a selective operation valve means with said action stroke pressure means only during the predetermined portion of the displacement of the punch, characterized in that the pressure medium source includes a pressure medium reservoir and a pressure medium pump means, said pressure medium reservoir and said pressure medium pump means providing a pressure having a value greater than a pressure of the pressure medium supplier means, and in that means are provided for driving said pressure medium pump means, characterized in that said driving means includes a drive motor, said drive motor is operatively connected with both said pressure medium pump means and said pressure medium supplier means for effecting a common driving thereof.

4,125,011

ELECTRICALLY CALIBRATED AIR GAUGING APPARATUS

David E. Porter, Alameda, Calif., assignor to PSW Associates, Hayward, Calif.

Filed Jan. 30, 1978, Ser. No. 873,121
Int. Cl.[2] G01L *27/00*
U.S. Cl. 73—4 R **13 Claims**



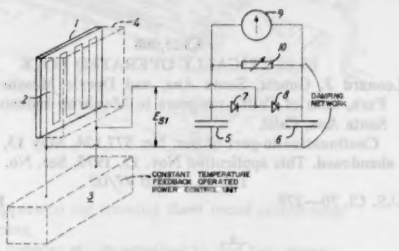
1. A fluid gauging apparatus comprising:
a source line for coupling to a source of fluid;
a probe coupled to said source line for receiving at least a portion of the fluid flowing in said source line;
a monolithic pressure transducer coupled to sense the pressure of fluid flowing to said probe;
reading means for providing a reading;
electrical means coupled to said transducer and said reading means for driving said reading means in response to said pressure sensed by said transducer;
said electrical means including a first and second electrical adjustment for allowing a first electrical adjustment when said probe engages a first standard and a second electrical adjustment when said probe engages a second standard, said electrical adjustments to permit calibration of said apparatus;
whereby said apparatus is calibrated without fluid adjustments.

4,125,012

APPARATUS FOR MEASURING THERMAL DISCOMFORT ORIGINATING FROM ASYMMETRY IN THE THERMAL FIELD OR VARIATIONS WITH TIME OF THE THERMAL INFLUENCE ON THE SKIN

Thomas L. Madsen, No. 11 Rosengärdsvej, 2830 Virum, Denmark

Filed Jun. 21, 1976, Ser. No. 697,757
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1975, 2528340; Denmark, Nov. 17, 1975, 5159/75
Int. Cl.[2] G01N *25/00*
U.S. Cl. 73—15 R **4 Claims**



1. Apparatus for measuring thermal discomfort originating from a draft, comprising
an electrically heatable element exposed to the cooling effect of said draft,
means for sensing the temperature of said heatable element,
means for supplying electric energy to said heatable element in response to the sensed temperature so as to maintain said heatable element at a substantially constant, elevated temperature in relation to the ambient air in spite of the varying cooling effect of said draft,
means for deriving from said electric energy delivered to said heatable element a first electrical signal which varies with the variations of the cooling effect of the draft on said heatable element,
means for damping amplitude variations in the frequency ranges of said first electrical signal below approximately 0.1 Hz and above approximately 1 Hz in relation to the amplitude variations of said first electrical signal within this frequency range to produce a second electrical signal simulating the response of human thermoreceptors to draft conditions, and
means for displaying said second electrical signal.

4,125,013

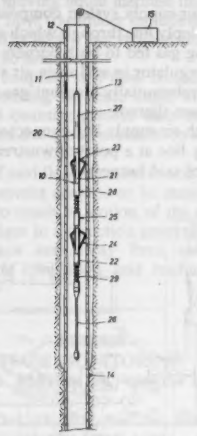
ANCHORING APPARATUS FOR TOOLS USED IN DETERMINING THE STUCK POINT OF A CONDUIT IN A BOREHOLE

Yves Nicolas, Versailles, and Jacques Tromelin, Longjumeau, both of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Sep. 19, 1977, Ser. No. 834,193
Claims priority, application France, Sep. 28, 1976, 76 29055
Int. Cl.[2] E21B *47/00*
U.S. Cl. 73—151 **5 Claims**

1. A well tool adapted for suspension in a string of pipe to obtain measurements representative of deformations occurring therein upon the application of forces to the upper end thereof for determining at least the approximate location at which that string of pipe may be stuck in a well bore and comprising:
upper and lower tool bodies;
sensor means tandemly supported between said upper and lower bodies and cooperatively arranged for producing output signals in response to relative motion between said upper and lower bodies; and
tool-anchoring means including a plurality of wall-engaging anchors spatially disposed around and pivotally supported

from at least said upper body, first means selectively operable for pivoting said anchors outwardly from said upper body to bring each of said anchors into engagement with an adjacent pipe string wall, and second means operative



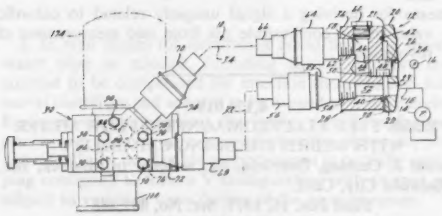
only upon outward pivotal movement of said anchors for stabilizing said anchors against at least significant angular movement in relation to said upper body once said anchors are engaged with an adjacent pipe string wall.

4,125,014

ENGINE OIL PUMP TEST ASSEMBLY

Cornell Candea, Clawson, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Aug. 26, 1977, Ser. No. 828,015
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—49.7 **12 Claims**



1. A fluid pressure test assembly for an engine having a lubrication oil pump driven thereby and a filter mounted thereon fluidly intermediate said pump and a portion of said engine, the test assembly comprising:

A. housing means adapted to be mounted on said engine in place of said filter and including means defining a fluid inlet port fluidly communicating at one end with the outlet of said pump and a fluid return port fluidly communicating at one end with said engine portion: and

B. test valve means in fluid communication with the other end of said housing means fluid inlet port and the other end of said housing means fluid outlet port and including:

1. a selector valve assembly operative in one condition to port fluid from said inlet port to said outlet port and in another condition to prevent the flow of fluid therebetween;

2. means for determining the fluid pressure between said pump and said selector valve assembly; and

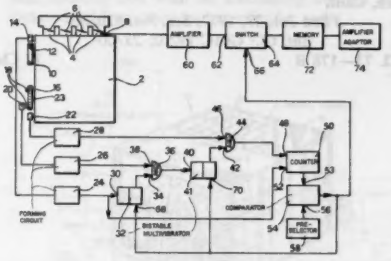
3. a safety valve assembly operative to bypass said selector valve assembly to permit fluid communication between said inlet port and said outlet port after a predetermined duration of engine operation with said selector valve assembly being operative in said other condition.

4,125,015

PROCESS AND DEVICE FOR DETERMINING THE QUANTITY OF AIR INDUCTED BY AN INTERNAL COMBUSTION ENGINE

Vittorio Di Nunzio, Turin, and Umberto Bigliani, Leumann-Collegno (Turin), both of Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed May 10, 1977, Ser. No. 795,599
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—118 **7 Claims**



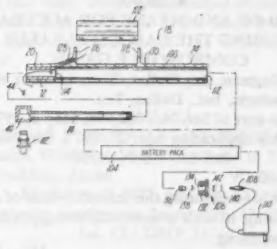
1. Process for determining the rate of flow of air inducted into a four cylinder fuel injection Otto cycle engine having one throttle per cylinder and inlet valves in each cylinder, wherein the pressure of the inducted air is measured by a transducer located between the throttle and the inlet valve of at least one said cylinder, and the resulting pressure signal is sampled within a precise range of angular positions of the engine crankshaft.

4,125,016

BATTERY OPERATED TORQUE WRENCH WITH DIGITAL DISPLAY

Kenneth A. Lehoczky, Livonia, Mich., and Robert B. Edwards, South Bend, Ind., assignors to GSE, Inc., Farmington Hills, Mich.

Filed Jul. 6, 1976. Ser. No. 702,670
Int. Cl.[2] B25B *23/14*
U.S. Cl. 73—139 **15 Claims**



1. In an electronic torque wrench of the class having an elongated body for operating as a torquing lever and terminating at one end in a receptacle adapted to rotate coaxially with a workpiece about an axis of rotation,

a solid flexure element of high modulus of elasticity material, non-rotatably, removably insertable into the receptacle and having a drive for engaging the workpiece, visual

read-out means mounted on the body, circuit means carried by the body for receiving strain signals, for converting said strain signals into torque signals and for actuating said read-out means with said torque signals,

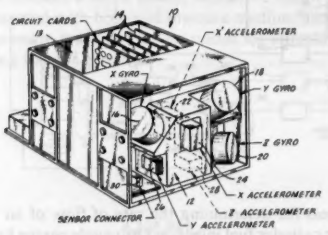
strain responsive means mounted on the flexure element for producing a strain signal related to the torque transmitted by the flexure element, and means connecting the strain responsive means to the circuit means through at least a portion of said body.

4,125,017

REDUNDANT INERTIAL MEASUREMENT SYSTEM

Henry J. Dhuyvetter, Westminster; Paul D. Engelder, Rancho Palos Verdes, and Joseph C. Simmons, Manhattan Beach, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jul. 29, 1977, Ser. No. 820,249
Int. Cl.[2] G01C *19/02, 23/00*
U.S. Cl. 73—178 R **12 Claims**



1. A redundant inertial measurement system for use in space navigation comprising:

three gyros, each having at least two degrees of freedom and including first and second mutually orthogonal axes;

means for mounting said gyros in three distinct attitudes with the respective first axes orthogonally directed with respect to each other so as to develop a first orthogonal triad including the first axis of each gyro and the respective second axes directed at 45° with respect to corresponding pairs of said first axes so as to develop a second triad skewed at 45° to the first triad, the second triad including the second axis of each gyro;

means for deriving rate information relative to the first and second triads; and

means for processing said information.

4,125,018

METHOD OF AND MEANS FOR ACCURATELY MEASURING THE CALORIFIC VALUE OF COMBUSTIBLE GASES

William H. Clingman, Jr., Dallas, Tex., assignor to Precision Machine Products, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 682,578, May 3, 1976, Pat. No. 4,032,256. This application Apr. 27, 1977, Ser. No. 791,462
Int. Cl.[2] G01N *25/30*
U.S. Cl. 73—190 CV **9 Claims**

1. Apparatus for measuring the calorific value of a combustible gas by mixing it with a combustion supporting gas and burning it, comprising:

a pair of burners;

a fuel supply system comprising:

a main fuel supply line through which all of the combustible gas fed to both burners is passed;

a fuel flow adjusting valve in said main fuel supply line;

a first branch fuel supply line connected between said main fuel supply line at a point downstream of said flow adjusting valve and one of said burners;

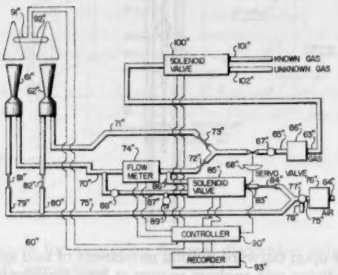
a second branch fuel supply line connected between said main fuel supply line at a point downstream of said flow adjusting valve and the other of said burners;

capillary means in each of said branch fuel supply lines for establishing selected rates of fuel flow to said burners; and a turbine meter in one of said branch fuel supply lines; an air supply system comprising:

a main air supply line through which all of the combustion supporting gas fed to both burners is passed;

a pressure regulator in said main air supply line for establishing a substantially constant gas pressure in said line downstream thereof;

a first branch air supply line connected between said main air supply line at a point downstream of said regulator and one of said burners;



a second branch air supply line connected between said main air supply line at a point downstream of said regulator and the other of said burners;

capillary means in each of said branch air supply lines for establishing selected rates of air flow to said burners; thermocouple means for sensing the temperatures of the burned gases in said burners;

means responsive to said thermocouple means for adjusting said fuel flow adjusting valve to establish a fuel flow rate to maximize the average of said temperatures;

means for measuring the revolutions of said turbine meter; and

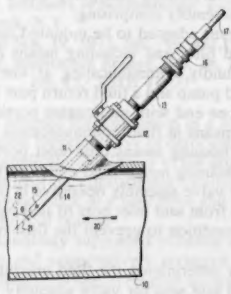
means for deriving a signal uniquely related to calorific value of the combustible gas from said measurement of revolutions.

4,125,019

PROBE TYPE ELECTROMAGNETIC FLOW METER WITH DEBRIS SHEDDING CAPABILITY

Vincent J. Cushing, Deerfield, Ill., assignor to Monitek, Inc., Redwood City, Calif.

Filed Jun. 16, 1977, Ser. No. 807,288
Int. Cl.[2] G01F *1/58*
U.S. Cl. 73—194 EM **11 Claims**



1. An electromagnetic flow sensor capable of debris shed-

ding for accurate flow measurement in environments which include rigid or non-rigid debris comprising:

a rigid support,

a flow transducer, having a longitudinal axis, adapted to be immersed in a moving liquid medium flowing in a defined direction, said flow transducer including at least a pair of electrodes, said at least a pair of electrodes lying on a line perpendicular to said axis,

coupling means coupling said flow transducer to said support for maintaining an acute angle at least equal to a predetermined quantity greater than zero between said longitudinal axis and a perpendicular to said defined direction,

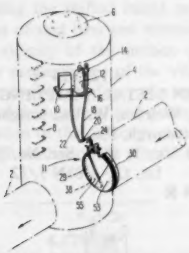
a leading edge of said flow transducer and those portions of said coupling means adapted to be immersed in said medium shaped to result in motion of the debris contacting said leading edges in a direction generally parallel to said longitudinal axis and away from said rigid support whereby debris contacting said leading edges is shed thereby.

4,125,020

FLOW MONITORING

Charles L. McClure, Malvern, Pa., assignor to Pro-Tech, Inc., Paoli, Pa.

Filed Dec. 23, 1977, Ser. No. 863,862
Int. Cl.[2] G01F *1/20*
U.S. Cl. 73—215 **14 Claims**



1. In weir means for monitoring liquid flow in a sewer or water pipe or conduit, including flexible support means adapted to be compressed for insertion thereinto and for removal therefrom and adapted to be expanded while therein for frictional retention against the inside wall thereof, the improvement comprising a pair of platelike pieces supported individually by the flexible support means in partially overlapping contiguity to form a V configuration with an apex angle subject to variation upon flexing of the support means.

4,125,021

APPARATUS FOR DETECTING CONDUCTIVE LIQUID LEVEL

Mitsuru Kamei; Uno Osamu; Ogawa Toru, all of Oarai; Ishii Yoichiro, Yokohama, and Satomi Masahiro, Hitachi, all of Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo and Nisco Kabushiki Kaisha, both of, Japan

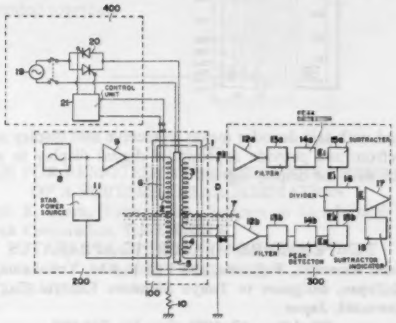
Filed Jun. 1, 1976, Ser. No. 692,023
Int. Cl.[2] G01F *23/26*
U.S. Cl. 73—304 R **13 Claims**

1. An apparatus for detection of the level of a liquid metal comprising:

(a) a liquid level detecting probe having a closed bottom non-magnetic sheath, an exciting coil within said sheath and extending longitudinally over substantially the whole length of said sheath, a liquid level detecting coil extending longitudinally within an upper part of said sheath, a temperature compensating coil extending longitudinally within said sheath below said liquid level detecting coil, a heating element extending longitudinally within said sheath, and at least one temperature sensing element provided in an appropriate position to sense the temperature of said coils in said sheath, said probe during use being immersed in the liquid metal the level of which is to be detected to a depth such that said temperature compensating coil is always located below the level of said liquid metal;

(b) a temperature control circuit coupled to said heating element and to said temperature sensing element for controlling the supply of current to said heating element in response to the signals from said temperature sensing element for maintaining said coils at a constant temperature and thereby preventing changes of resistance of said coils;

(c) a drive circuit coupled to said exciting coil for supplying said exciting coil with an alternating current having a determined frequency and amplitude; and



(d) a signal processing circuit having a first series connected amplifier, filter, rectifier and subtracter connected to the output of said liquid level detecting coil, a second series connected amplifier, filter, rectifier and subtracter connected to the output of said temperature compensating coil for linearly detecting voltages induced in said level detecting coil and said temperature compensating coil and subtracting therefrom predetermined voltages equal to the linearly detected voltages induced in the level detecting coil and the temperature compensating coil, respectively, by the alternating current supplied to said exciting coil by said drive circuit when said level detecting probe is in the atmosphere, a divider connected to said subtracters for determining the ratio of the outputs from said subtracters, and an indicator coupled to said divider for visually indicating said ratio, whereby the output of the signal processing circuit is proportional to the exact level of the liquid metal and independent of the temperature changes thereof.

4,125,022

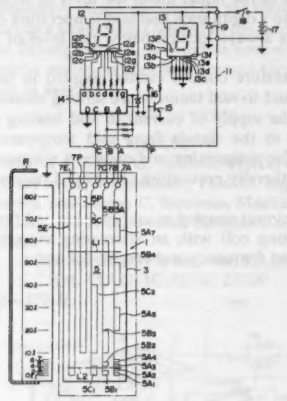
DIGITAL FUEL QUANTITY INDICATORS

Shizuo Sumida, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Sep. 7, 1977, Ser. No. 831,165
Claims priority, application Japan, Sep. 13, 1976, 51-110505
Int. Cl.[2] G01F *23/10*
U.S. Cl. 73—313 **6 Claims**

1. Digital type fuel quantity indicator comprising means provided in fuel reservoir means for sensing level of fuel in said fuel reservoir means including a plurality of stationary contact elements located at different levels in said fuel reservoir so that they represent different fuel levels and at least one movable contact element which is carried by float means in said fuel reservoir means and adapted to cooperate with said stationary contact elements for producing binary signals in accordance with the level of fuel in said reservoir means, decoder means

connected with said fuel level sensing means so as to receive said binary signals therefrom and produce display signals in accordance with the binary signals, and display means connected with said decoder means to receive said display signals therefrom and provide appropriate digital display in accordance with the display signals.

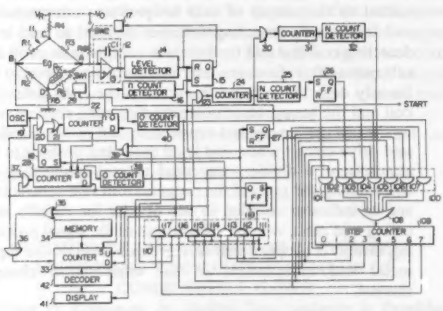


4,125,023

TEMPERATURE-MEASURING APPARATUS

Hiroshi Amemiya, Fujisawa, and Yukito Abe, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Dec. 17, 1976, Ser. No. 751,679
Claims priority, application Japan, Dec. 20, 1975, 50-152491
Int. Cl.[2] G01K *7/16*
U.S. Cl. 73—362 AR **16 Claims**



1. A temperature measuring apparatus comprising:

dual slope type analog signal generating means which includes first and second power supply terminals, a standard resistor whose resistance is little affected by temperature change, a series circuit connected between said first and second power supply terminal and including a passive circuit element connected at one terminal to said first power supply terminal, a thermo-sensitive resistor whose resistance varies with temperature and becomes equal at a reference temperature to the resistance of said standard resistor and first switching means taking first and second operative positions to respectively connect said thermo-sensitive resistor and standard resistor to said passive circuit element between said first and second power supply terminals, a third power supply terminal, a series circuit of resistive means and second switching means connected between the other terminal of said passive circuit element and said third power supply terminal, and an integrating circuit whose input terminal is connected to the other terminal of said passive circuit element;

digital data generating means responsive to an output signal from said integrating circuit for producing digital data corresponding to the measured resistances of said thermo-sensitive resistor and standard resistor according to the operative positions of said first switching means and thereafter for producing a switch control signal;

switch setting means for selectively setting said first switching means to the first or second operative position and setting said second switching means to connect said third power supply terminal to the other terminal of said passive circuit element through said second switching means and said resistive means a predetermined time after said integrating circuit has started an integrating operation; and

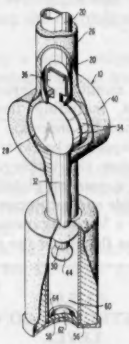
a processing circuit for processing the digital data which are supplied from said digital data generating means and correspond to the measured resistances of the thermo-sensitive resistor and standard resistor and producing temperature data corresponding to the resistance of the thermo-sensitive resistor.

4,125,024

MOLTEN METAL SAMPLING DEVICE

Van L. Vierbicky, Weirton, W. Va., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed May 5, 1977, Ser. No. 794,241
Int. Cl.[2] G01N *1/12*
U.S. Cl. 73—425.4 R **45 Claims**



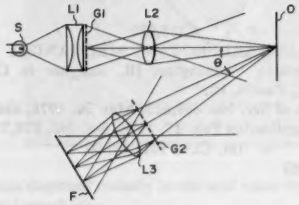
1. A molten metal sampling device including an insulating housing having a mold cavity therein for forming a solidified sample of the metal, said sampling device comprising a diffusion chamber having an inlet therein for receiving molten metal, means defining an opening between said mold cavity and said diffusion chamber, first closure means closing said opening, said first closure means being destructible by the heat of the molten metal to be sampled to thereby provide communication between said diffusion chamber and said mold cavity only after molten metal is received in said diffusion chamber, and second closure means closing said inlet, said second closure means being destructible by the heat of molten metal to thereby admit molten metal into said diffusion chamber when the sampling device is submerged in the molten metal to be sampled.

4,125,025

INSTRUMENT FOR MEASURING THE AMPLITUDE OF VIBRATION OF A VIBRATING OBJECT

Masane Suzuki; Kiyoshi Suzuki, and Kenji Yasuda, all of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Jan. 21, 1977, Ser. No. 761,326
Claims priority, application Japan, Jan. 21, 1976, 51-5543
Int. Cl.[2] G01H 9/00
U.S. Cl. 73—655 8 Claims



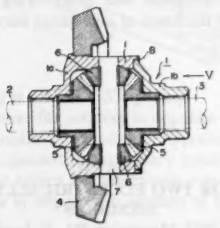
1. An instrument for measuring the amplitude of vibration of a vibrating object comprises a first optical system including a light source and a grating for periodically projecting the image of the grating onto a vibrating object, and a second system including means for laterally shifting the image of the grating projected on and reflected from the vibrating object and focusing means for focusing the shifted image on a photographic film, the optical axes of said first and second optical systems intersecting in the vicinity of the surface of said vibrating object, whereby the measurement of the vibration of the vibrating object is obtained in the form of a moire pattern; said periodic projection of the image of said grating being synchronized with the vibration of the object to occur at a frequency which is twice as high as that of the vibration of the vibrating object.

4,125,026

DIFFERENTIAL DEVICE FOR VEHICLES

Kyozo Torii; Kenji Koshino, both of Toyota; Yuji Niimi, Aichi; Mashahiro Ogawa, and Keizo Kamo, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 25, 1975, Ser. No. 590,075
Claims priority, application Japan, Dec. 23, 1974, 49/139030[U]
Int. Cl.[2] F16H 1/40; B21H 5/04
U.S. Cl. 74—713 2 Claims



1. A differential device comprising:

a left casing portion which constitutes a part of a differential casing and through which a left axle shaft runs;

a right casing portion which constitutes the remaining part of said differential casing and is directly or through a ring gear integrally joined to said left casing portion by electron beam welding wherein said left and said right casing portions comprise casings of steel plate formed by plastic working;

side gears respectively disposed in said right and left casing portions, and a pinion mounted within one of said casing portions and interposed between and operatively engaged with said side gears; and

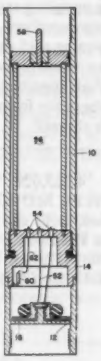
a ring gear which is electron beam welded integrally to at least one of said casing portions and joined with said casing portions at a first position located at the outer periphery portion on the backside of said ring gear and at a second position located at the inner periphery portion of said ring gear such that the deformation due to welding strain at said second position cancels the deformation due to welding strain at said first position to minimize the resulting deformation and strain due to welding wherein pinion shaft holes are provided at opposite positions in one of said casing portions and wherein a pinion shaft inserted into said holes and said casing portion are integrally welded together.

4,125,027

GAUGE FOR REMOTELY INDICATING THE PRESSURE OF A SUBTERRANEAN FORMATION

Kenneth K. Clark, Tulsa, Okla., assignor to Geophysical Research Corporation, Tulsa, Okla.

Filed Nov. 4, 1977, Ser. No. 848,613
Int. Cl.[2] G01L 9/12
U.S. Cl. 73—724 6 Claims



1. Apparatus for providing a variable capacitance effect in response to changes in ambient pressure, comprising:

a housing having a deformable portion having an interior and an exterior surface, the deformable portion forming a diaphragm, the exterior surface of which is subject to ambient pressure, said portion having a boss extending from its inner surface;

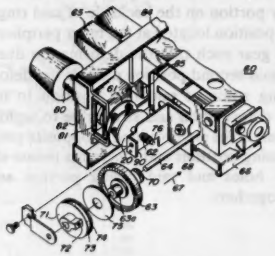
a stator having a central hub having an opening therein receiving said boss portion, and the stator having a planar portion positioned adjacent to and spaced from said interior surface of said housing deformable portion, the stator having a lip adjacent said opening, the lip extending from said planar portion and having engagement with said housing deformable portion interior surface, the lip serving to accurately position said stator relative to said housing deformable end, at least part of the surface of said stator planar portion adjacent said housing end interior surface being of conductive material forming a capacitance relationship with said housing deformable end.

4,125,028

ROTATABLE LINK COUPLING MECHANISM FOR RADIO TUNING SHAFTS

Frank J. Gordon, Chicago, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 8, 1977, Ser. No. 822,975
Int. Cl.[2] H03J *1/06*; F16D *3/04*
U.S. Cl. 74—10 R **3 Claims**



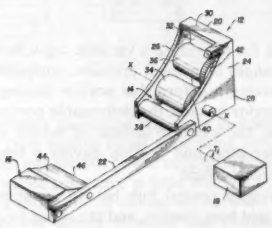
1. An improved coupling apparatus for coupling rotatable shaft members comprising
first and second shaft members supported for rotation on axes,
first and second resilient disc members affixed to said first and second shaft members, respectively,
a third resilient disc member positioned intermediate said first and second disc members,
said disc members each having a plurality of pin members extending axially therefrom and each of said pin members being formed with a circumferential groove therein,
link members pivotally coupling said disc members together by engaging said pin members in the grooves thereof whereby upon positioning said shaft members on non-parallel axes, flexing can occur between said disc members, link members, and shaft members,
wherein said link members are formed with resilient opened portions on the ends thereof.

4,125,029

WHEELED VEHICLE MOVING APPARATUS

John E. Krezak, Claymont, Del., and John R. Matics, Brookhaven, Pa., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1977, Ser. No. 838,325
Int. Cl.[2] F16H *37/00, 13/02*; B60K *17/00*
U.S. Cl. 74—13 **13 Claims**



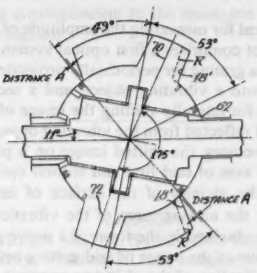
1. An apparatus for moving a wheeled vehicle along a surface, comprising
(a) a housing;
(b) drive means mounted to the housing for engaging a wheel of the wheeled vehicle and the surface along which the wheeled vehicle is moved;
(c) torque generating means engageable with the drive means for imparting a driving torque to the drive means, thereby producing rotation of said wheel of the wheeled vehicle for movement of the vehicle along said surface; and
(d) torque reacting means mounted to the housing for engaging said wheel of the wheeled vehicle and producing thereby a reaction force for the apparatus sufficient to react the driving torque imparted to the drive wheel.

4,125,030

SLANT AXIS ROTARY MECHANISM

David E. Hackett, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 689,613, May 24, 1976, abandoned.
This application Feb. 17, 1978, Ser. No. 878,734
Int. Cl.[2] F16H *23/00*
U.S. Cl. 74—60 **2 Claims**



1. In a slant axis rotary mechanism, the combination of:
a housing defining a chamber having radially inner and outer spherical walls interconnected by opposed, generally radially extending side walls;
a shaft journalled in said housing and having an angularly offset portion within said chamber;
a timing gear within said chamber at one side thereof and surrounding said shaft;
a rotor journalled on said angularly offset portion within said chamber having a spherical hub and a peripheral, radially outwardly extending flange extending from said hub; and
a ring gear carried by said hub on one end thereof and meshed with said timing gear;
the included angle between opposite portions of said flange on the side opposite said gears being less than 180° whereby the thickness of said flange may be increased.

4,125,031

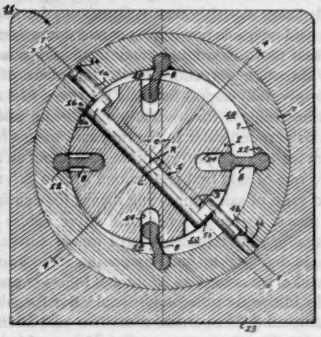
COUPLER FOR TWO ECCENTRICALLY ROTATING MEMBERS

James C. Swain, 3891 Mountview Rd., Columbus, Ohio 43220

Filed Jan. 3, 1977, Ser. No. 756,064
Int. Cl.[2] F16H *21/12*; F04C *1/00*
U.S. Cl. 74—63 **9 Claims**

1. A coupling for a driving interconnection between a rotating inner member and an eccentrically mounted rotatable outer ring, comprising in combination,
a crank shaft having two crank pins offset from the crank shaft axis;

means rotatably receiving the crank shaft in the inner member; and



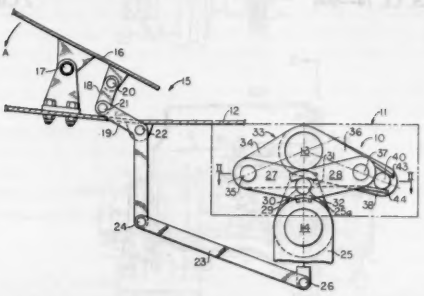
slot means disposed radially in the said outer ring to receive the said crank pins.

4,125,032

ACTUATING MECHANISM FOR HYDROSTATIC TRANSMISSION

Lucien B. Shuler, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 24, 1977, Ser. No. 809,724
Int. Cl.[2] F16H *21/44*; G05G *1/14, 7/04*
U.S. Cl. 74—96 **7 Claims**



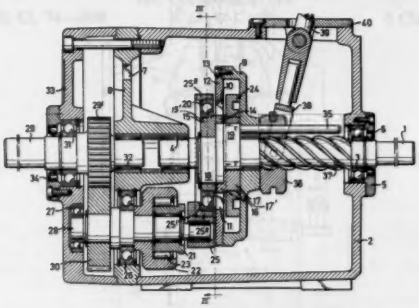
1. An actuating mechanism comprising
rotary input means for rotating in opposite directions,
rotary output means for rotating in opposite directions,
drive means connected to said rotary input means and said rotary output means for selectively rotating said rotary output means in response to rotation of said rotary input means, and
biasing means interconnected between said input means and said rotary output means for selectively rotating said rotary output means in opposite directions in response to rotation of said rotary input means in opposite directions,
said input means comprising a pair of links and lost-motion connection means for permitting movement of only one of said links upon rotation of said input means in one direction.

4,125,033

REGULABLE APPLIANCE FOR INFINITELY ADJUSTABLE VARIATOR, ESPECIALLY FOR VEHICLES

Franz Riedl, Amselweg, 8941 Boos, Fed. Rep. of Germany

Continuation of Ser. No. 579,588, May 21, 1975, abandoned. This application Jul. 14, 1976, Ser. No. 705,106
Claims priority, application Fed. Rep. of Germany, May 21, 1974, 2424577
Int. Cl.[2] F16D *29/00*; F16H *29/04*
U.S. Cl. 74—125.5 **10 Claims**



1. An infinitely adjustable variator arrangement which includes a housing, a drive shaft means rotatably mounted in the housing, first and second plane disks mounted on said drive shaft and rotatable therewith, the first of the plane disks being operatively connected with idling coupling means for controlling the movement thereof, the second of the plane disks serving as a counterweight for the first plane disk, a third plane disk for adjusting the position of the first and second plane disks, means for concentrically mounting the third plane disk on the drive shaft, means for revolving the third plane disk on the drive shaft so that the revolving movement with respect to the drive shaft is at least one of equal to, lower and higher than the rotating speed of the drive shaft, a sleeve means mounted for shifting movement on the drive shaft, the improvement comprising: a pair of slots provided in the third plane disk, cam means provided on each of the first and second plane disks engageable in a respective one of said pair of slots, an eccentric bore provided in each of the first and second plane disks, and a pair of disk means fixedly mounted to the drive shaft and disposed in a respective eccentric bore of the first and second plane disks.

4,125,034

LEVER MECHANISM

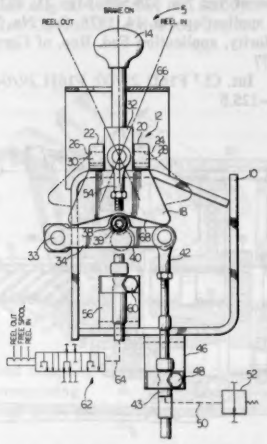
Ronald E. Wineburner, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 13, 1977, Ser. No. 815,384
Int. Cl.[2] G05G *9/04*
U.S. Cl. 74—471 XY **4 Claims**

1. A lever mechanism comprising:
a bracket;
a lever;
pivot means mounting said lever on said bracket for allowing rotational movement of said lever relative said bracket in first and second normally oriented planes;
a first push rod associated with said bracket and movable longitudinally relative said bracket;
a cam plate associated with said pivot means and defining a cam surface of a predetermined pattern;
an arm having a first and second end, said arm pivotally mounted at said first end to said bracket, said first push rod pivotally affixed to said second end of said arm;

a cam follower associated with said arm intermediate said first and second ends for following said cam surface;

said cam surface imparting motion to said first push rod in the same direction and at the same rate upon movement of said lever in opposite directions in said first plane;



second push rod means associated with said bracket and responsive to rotational movement of said lever in said second plane for movement of said second push rod means in first and second longitudinal directions relative said bracket; and

a slotted plate associated with said bracket for limiting movement of said lever to a predetermined pattern.

4,125,035

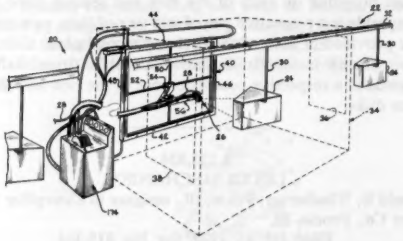
CONTROL MECHANISM FOR SPRAY GUNS AND THE LIKE

Richard A. Dooley, 400 S. Westwood Ave., Toledo, Ohio 43609

Filed Feb. 9, 1977, Ser. No. 766,972

Int. Cl.[2] G05G *11/00;* **B05B** *3/00, 9/06;* **B05C** *5/00*

U.S. Cl. 74—480 R **24 Claims**



1. Apparatus for manipulating a tool or the like for performing an operation on a workpiece, said apparatus comprising a frame, first and second elongate supporting members carried by said frame and crossing one another, a mounting member slidably mounted on crossing portions of said elongate members, racks and pinions carried by said frame for moving said supporting members across said frame when said racks are moved, fluid-operated means for moving each of said racks, a control cable connected to each of said racks and movable therewith, remote control means for operating said fluid-operated means, said remote control means comprising a cam for each of said fluid-operated means, a follower arm contacting said cam, a first valve, means connecting said follower arm and said valve for supplying fluid to the corresponding fluid-operated means when said follower arm is moved, and means connecting the corresponding control cable to said connecting means to move said connecting means when the control cable is moved; means movably connecting the tool to said mounting member, said movable connecting means comprising means for moving said tool toward and away from said mounting member in a direction perpendicular to the plane of the frame, means for pivotally supporting said tool on a first axis parallel to the frame, means for pivotally supporting said tool on a second axis perpendicular to the first axis, means for pivotally moving at least an end portion of the tool about an axis perpendicular to one of said first and second axes, a drive cable connected to each of said supporting means for causing said supporting means to move when said drive cables are moved longitudinally; said remote control means further operating each of said drive cables and comprising an additional cam for each of said drive cables, an additional follower arm in contact with said additional cam, an additional valve for said additional cam, additional fluid-operated means for said additional valve and connected to the corresponding drive cable, means connecting said additional follower arm and said additional valve for supplying fluid to said additional fluid-operated means when said additional follower arm is moved by said additional cam, a speed control cam, cam-rotating means for rotating said cams, a speed control follower arm engagable with said speed control cam, a speed control connected with said cam-rotating means for changing the rate of rotation and means connecting said speed control follower arm and said speed control for changing the rate of rotation when said speed control follower arm is moved.

4,125,036

APPARATUS FOR DRIVING ENGINE BALANCERS

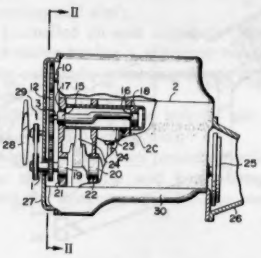
Hirokazu Nakamura, and Hikoichi Motoyama, both of Kyoto, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Japan

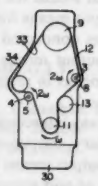
Division of Ser. No. 614,163, Sep. 17, 1975, Pat. No. 4,074,589. This application Jun. 1, 1977, Ser. No. 802,305

Claims priority, application Japan, Oct. 16, 1974, 49-119778

Int. Cl.[2] F16F *15/10*

U.S. Cl. 74—604 **2 Claims**





1. A cylinder and piston engine, comprising;

a cylinder block;

a crankshaft disposed therein and having cylinder and piston means for rotating it at a crankshaft speed;

a cam shaft for timing intake and exhaust operations in the cylinder means; and

a balancer system for balancing vibromotive forces acting on the cylinder block on operation of the piston means, the system comprising first and second balancer shafts laterally spaced from the crankshaft on two sides of that shaft and disposed substantially parallel thereto, and a timing mechanism disposed at an end of the cylinder block and driven by the crankshaft for driving the balancer shafts and also the cam shaft, the timing mechanism comprising a single elongate endless member operatively connected with the several shafts to drive the first and second balancer shafts in directions opposite to one another, both at a speed equal to twice the crankshaft speed, the endless member having two mutually opposite sides thereof and the shafts having rotors rigidly fitted therein for the operative connection of the endless member with the shafts, the rotor of the first balancer shaft being engaged with one of the sides of the endless member, and the rotor of the second balancer shaft being engaged with the other side of the endless member to effect the rotating of the balancer shafts in opposite directions.

4,125,037

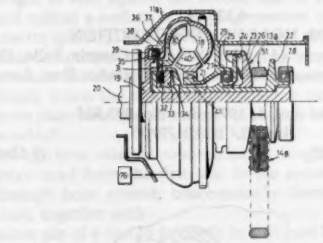
VARIABLE SPEED TRANSMISSION MEANS

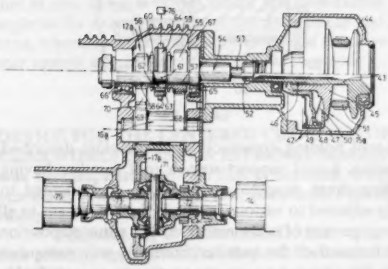
Bertram J. Palmer, Birmingham, England, and Herbert K. Steuer, Bad Homburg, Fed. Rep. of Germany, assignors to GKN Transmissions Limited, England

Continuation of Ser. No. 641,681, Dec. 17, 1975, abandoned. This application Mar. 18, 1977, Ser. No. 778,890

Int. Cl.[2] F16H *47/00, 55/52*

U.S. Cl. 74—732 **7 Claims**





1. A transmission means comprising a hydrokinetic torque converter for drive by a prime mover, said torque converter including a turbine and an output shaft, a continuously variable speed drive connected to said output shaft, and selectively operable change direction gearing driven by said drive and in turn driving a rotary output, said gearing having a neutral state in which the output is disconnected from said drive and said torque converter including clutch means interposed between said torque converter turbine and said output shaft thereof, selectively operable to interupt drive through said torque converter.

4,125,038

SPEED CHANGE GEAR IN A HYDRAULIC TYPE AUTOMATIC TRANSMISSION

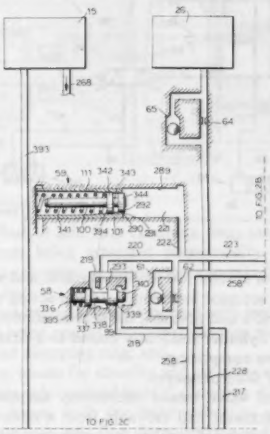
Takeo Hiramatsu, Nagaokakyo, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1977, Ser. No. 787,463

Claims priority, application Japan, Dec. 9, 1976, 51-148501

Int. Cl.[2] B60K *41/18*

U.S. Cl. 74—869 **6 Claims**



1. A speed change gear in a hydraulic type automatic transmission including a fluid torque converter and a plurality of friction-engagement devices associated with hydraulic servo devices, in which different speed change ratios including a plurality of forward movement steps can be realized by selectively actuating said friction-engagement devices with a hydraulic pressure either automatically or manually; characterized in that said speed change gear comprises a first friction-engagement device for realizing a predetermined gear ratio, a second friction-engagement device for realizing a higher speed gear ratio than said predetermined gear ratio, a hydraulic pressure source, a hydraulic pressure regulating valve for controlling a line pressure generated by said hydraulic pressure source, a first hydraulic servo device for engaging said first friction-engagement device, a second hydraulic servo device for engaging said second friction-engagement device, a first hydraulic path for feeding a hydraulic pressure regulated by said hydraulic pressure regulating valve to said first hydraulic servo device, a second hydraulic path for feeding said regulated hydraulic pressure to said second hydraulic servo device, a switching valve interposed in the midway of said first and second hydraulic paths for selectively switching the hydraulic pressure feed to said first and second hydraulic servo devices, a control valve disposed in the midway of said first and second hydraulic paths for controlling switching between the state of feeding a hydraulic pressure to said respective hydraulic paths and the state of exhausting pressurized oil fed to the respective hydraulic paths, a flow rate limiter and a gate valve interposed in parallel in the midway of said first hydraulic path between said switching valve and said control valve, and an accumulator disposed in said first hydraulic path between said switching valve and said flow rate limiter and gate valve, said gate valve being adapted to be opened to communicate a hydraulic path for by-passing said flow rate limiter when the hydraulic pres-

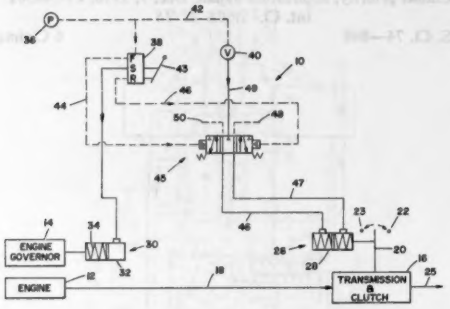
sure fed to said first hydraulic servo device exceeds a predetermined value.

4,125,039

ENGINE AND TRANSMISSION CONTROL SYSTEM

Dennis R. Helm, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 18, 1976, Ser. No. 733,646
Int. Cl.[2] B60K *41/18*; F16D *47/00*
U.S. Cl. 74—874 **10 Claims**



1. A control system for positioning first and second actuators, the first actuator including a double acting cylinder resiliently biased to a mid position, the second actuator including a single acting cylinder resiliently biased to a first position, the control system comprising:

a source of fluid pressure;

first control valve means operatively associated with the second actuator and movable from a neutral position in first and second directions for communicating fluid under pressure from said source of fluid pressure to said second actuator at varying pressures directly proportional to said movement of said first control valve means from said neutral position;

second control valve means operatively associated with the first actuator and movable from a neutral position in a first direction to supply fluid under pressure from said source of fluid pressure for communication to the first actuator at varying pressures directly proportional to said movement of said second control valve means from said neutral position; and

directional valve means interconnecting the second control valve means and the first actuator and responsive to movement of the first control valve means in said first direction for causing said fluid under varying pressures to be communicated to said first actuator from said second control valve means to urge said double acting cylinder in a first direction, and said directional valve means responsive to movement of the first control valve means in said second direction for causing said fluid under varying pressures to be communicated to said first actuator from said second control valve means to urge said double acting cylinder in a second direction.

4,125,040

POWER TONG APPARATUS

Martin E. True, Houston, Tex., assignor to Weatherford/Lamb, Inc., Houston, Tex.

Filed Sep. 29, 1977, Ser. No. 838,035
Int. Cl.[2] B25B *13/50*
U.S. Cl. 81—52.5 **8 Claims**

1. In a power tong system which includes,

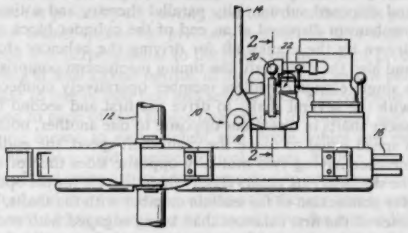
a. tong means for imparting rotation and torque to a tubular member to make a threaded connection with another member,

b. power means for driving the tong means,

c. a throttle lever to control the power means, and

d. means for sensing the torque or torque and turns being imparted to the tubular member by the tong means (a) and generating a signal upon sensing a predetermined torque or torque and turns,

the improvement comprising the provision of,



e. cammed means integrally formed of or secured to the throttle lever (c),

f. camming means coacting with and biased toward the cammed means (e), and

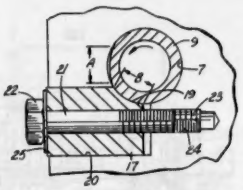
g. means for disengaging the camming means (f) from the cammed means (e) upon reception of the signal generated by the sensing means (d).

4,125,041

TOOL HOLDER CONSTRUCTION

Garland D. French, 44 Maple Hill Dr., Chagrin Falls, Ohio 44022, and Thomas J. Davies, 10240 Spinaker Run, Aurora, Ohio 44202

Filed Jun. 6, 1977, Ser. No. 803,533
Int. Cl.[2] B23B *29/00*
U.S. Cl. 82—36 R **3 Claims**

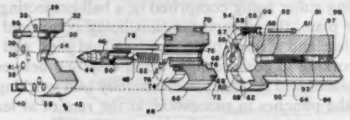


1. In tool holding construction of the class described, in combination, a tool support unit, a tool member having an offstanding shank mounted in said unit, and adapted to be rotatably adjusted to various positions therein, means to effect clamp engagement of said member in such adjusted positions to prevent removal of the member from said unit, comprising a clamp bushing having an arcuate portion to engage the shank, the arc of said portion being of predetermined length, and means on said shank to release said clamp engagement to facilitate such removal in at least one position, said means gripping a portion of the surface of said shank, the surface of the shank is formed with a section at least equal to such length and spaced therefrom when the shank is rotated to bring such section to a position co-extensive with said arc after the releaseable means are operated to release said grip to thereby release said clamp engagement.

4,125,042
POSITIVE ADJUST DRIVING CENTER

Frank M. Barron, Rte. 3, Clarkesville, Ga. 30523

Filed Aug. 15, 1977, Ser. No. 824,549
Int. Cl.[2] B23B *33/00, 23/02*
U.S. Cl. 82—40 R 5 Claims



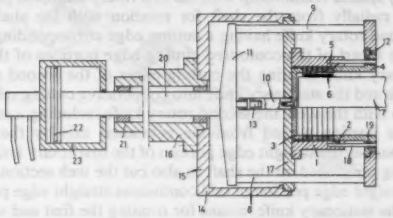
1. A work holding center assembly comprising
a drive plate mounted to
a drive head extending from
a drive shank,
said drive plate having a plurality of spaced work-engaging elements extending from a first side, with the second opposed side of the drive plate facing a first side of the drive head, and with the second opposed side of the drive head facing the external end of the drive shank,
said drive shank formed with a spherical shaped concave socket extending from the center of the face of the external end of the drive shank and concentrically located in said drive shank, with
a plug member shaped on one side with a convex spherical surface, said plug member mounted in said concave socket of the drive shank so that the convex surface of the plug member is in slidable relation with the surface of the concave socket,
said drive head formed with at least one through bore extending from the first side to the second side, with a compression member slidably mounted in each said bore of a length to bear against the second side of the drive plate and against a surface of the plug member opposed to the convex spherical surface so as to support the drive plate in axial compression against the said plug member, and so as to allow the drive plate to tilt with respect to the drive shank, when the space work-engaging elements of the drive plate bear against an uneven surface of a work piece, in which
a through bore extends concentrically along the axis of the drive head from the first side to the second side, and a through bore extends concentrically through the drive plate, together with
a center pin of a size to freely fit in both said bores and of a length to extend beyond the drive plate, said center pin fitted with means for bearing against the plug member, so that in use, the axis of the center pin may extend at an angle to the axis of rotation of the drive shank and drive head, when the work-engaging elements of the drive plate bear against an uneven surface of a work piece.

4,125,043
DEVICE FOR THE CENTERED CLAMPING OF ANNULAR WORKPIECES FOR INTERNAL MACHINING

Hermann Leutgäb, Derching, Fed. Rep. of Germany, assignor to Goetzewerke Friedrich Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Jul. 20, 1977, Ser. No. 817,519
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1976, 2633432
Int. Cl.[2] B23B *31/19;* B23P *19/04;* B23B *31/30*
U.S. Cl. 82—45 12 Claims

1. In a device for the centered clamping of an annular workpiece or workpiece stack formed of a plurality of annular workpieces, to hold the same in position for the machining of the inner faces thereof; the device including first and second axially aligned clamping rings for engaging opposite, radially extending end faces of a workpiece or workpiece stack positioned in a space between the clamping rings; a centering cylinder surrounding the space and having a lead-in chamfer at one edge thereof; and a clamping means for moving the two clamping rings relative to one another; the improvement wherein said clamping means comprises
(a) power means including means for actuating the power means in a clamping direction;
(b) force-transmitting means extending exclusively externally of said centering cylinder and coupling said clamping rings to one another and to said power means; said force-transmitting means having
(1) a transverse member;
(2) first and second rods each affixed to said transverse

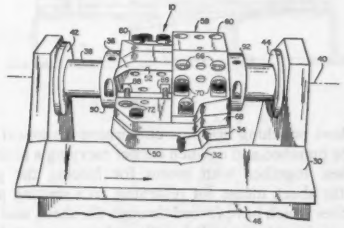


member and to said first clamping ring; said first and second rods being arranged diametrically oppositely relative to one another with respect to said first clamping ring; and
(3) a third rod being in axial alignment with said clamping rings and being coupled to said transverse member and said second clamping ring; and
(c) an axial stop means for abutting and arresting said second clamping ring when urged in said clamping direction by said power means with the intermediary of said force-transmitting means, said first clamping ring and the workpiece or workpiece stack for clamping the latter between said first and second clamping rings.

4,125,044
ROTARY CUTTING APPARATUS

Robert J. Carrigan, Enfield, Conn., and Gregory Georgiades, Springfield, Mass., assignors to Westvaco Corporation, New York, N.Y.

Continuation of Ser. No. 290,645, Sep. 20, 1972, abandoned. This application Dec. 20, 1976, Ser. No. 752,807
Int. Cl.[2] B26D *3/14*
U.S. Cl. 83—356.3 18 Claims



1. A rotary cutting apparatus for removing sections from a longitudinally advancing web of sheet material comprising: a stationary cutting knife over which at least one side of the advancing web of sheet material passes in a cutting operation, the stationary knife having contoured cutting edge portions determining the contours of one section of material to be removed from the one side of the web passing over the stationary cutting knife and having one continuous straight edge portion extending parallel to the advancing web; an arbor shaft sup-

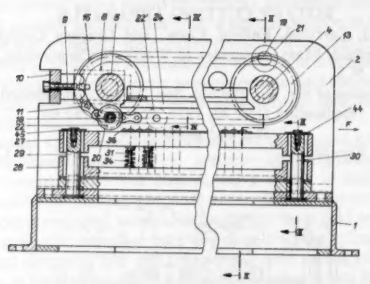
ported relative to the stationary knife for rotation about a rotational axis parallel to the longitudinally advancing web of material; a first rotary knife having a cutting edge corresponding to at least a part of the cutting edge portions of the stationary knife including a straight edge portion of said continuous straight edge portion of the stationary knife and supported on the arbor shaft in radially projecting relationship for rotation about the rotational axis with the shaft to bring the cutting edges of the first rotary knife and stationary knife into cooperative cutting relationship with the web at the one side and thereby cut at least part of a section from the web including a straight edge parallel to the side of the advancing web; a second rotary knife also mounted on the arbor shaft at an angularly spaced relationship with the first rotary knife and projecting radially from the shaft for rotation with the shaft, the second rotary knife having a cutting edge corresponding to at least a part of the contoured cutting edge portions of the stationary knife to bring the cutting edges of the second rotary knife and the stationary knife into cooperative cutting relationship with the web, the second rotary knife including a straight edge portion spaced from the rotational axis by the same amount as the straight edge portion of the first rotary knife and being positioned on the shaft to also cut the web section along a straight edge portion of said continuous straight edge portion of the stationary knife; means for rotating the first and second rotary knives and the arbor shaft about the rotational axis at a speed selected to cause the cuts produced by the straight edge portions of the rotary knives to overlap in the web along the straight edge as the web moves over the stationary knife; and means for adjusting the angularly spaced relationship of the first and second rotary knives on the shaft about the rotational axis to vary the degree of overlap along the straight edge and the size of the section removed.

4,125,045

SHEET PUNCHING MACHINE

Miroslav Jeremić, Belgrade, Yugoslavia, assignor to Kerason SA, Romanel, Switzerland

Filed Jun. 13, 1977, Ser. No. 806,067
Int. Cl.[2] B21D *28/26*; B26F *1/06*
U.S. Cl. 83—389 **4 Claims**



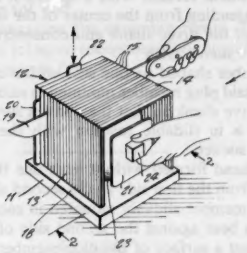
1. A sheet punching machine comprising a support for the sheet to be punched and a punch carrier carrying a multiplicity of punches, together with means for forcing the punches through the sheet, means for returning, to a starting position, said punches which have forced through the sheet, said forcing means comprising two parallel endless chains, mounted on two pairs of coaxial toothed wheels, fixed in rotation in pairs, a first transverse shaft fixed to the two chains and carrying a working roller, two running rollers, and two rectilinear support surfaces for the running rollers, said punches being axially movable at least approximately perpendicularly to the trajectory of said rollers and having a part which intersects the horizontal path of said working roller when said running rollers run on the said support surfaces, said returning means being elastic, and further comprising, dies cooperating with each punch, means for clamping the sheet to be punched, said clamping means being adapted to be operated by the working roller, said chains carrying a second transverse shaft mounted symmetrically to said first transverse shaft and carrying identical rollers, said punches being mounted in two superimposed plates, said plates adaptably mounted for sliding on vertical columns and fastened to one another at least during a greater part of their displacement, the part of the punches intersecting the path of the working roller being comprised of a ball projecting above the upper plate, the clamping means being comprised of the bottom plate and a fixed plate carrying said dies, and elastic means, working in compression, being disposed between said fixed plate and said bottom plate, whereby said working roller operates the punches in succession, at the rate of at least one punch at a time, during its displacement, when the running rollers run on the said support surfaces.

4,125,046

FOOD SLICER

Norma J. Kroh, and George Spector, both of 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Oct. 19, 1976, Ser. No. 733,847
Int. Cl.[2] B26D *4/50*
U.S. Cl. 83—437 **2 Claims**



1. A food slicer, comprising in combination, a base and a hollow frame mounted upon said base, said frame being shaped to fit around the periphery of an article of food placed upon a top surface of said base, including a series of parallel transverse slots through said frame for receiving a knife blade in combination with a separate end abuttment plate slidably fitting in said slots and a separate pusher plate having a hand knob, said article of food being held between said end abuttment plate and said pusher plate during a slicing operation, wherein said pusher plate comprises a flat plate member of shape and dimension to fit within said frame and base, said pusher plate being rotatable about an axis perpendicular to said pusher plate to a second position wherein portions of said pusher plate project through said slot outwardly beyond said frame to function also as a retaining plate to retain said food against said abuttment plate.

4,125,047

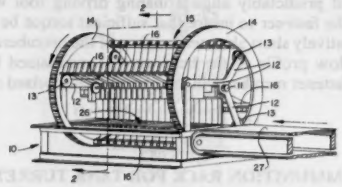
CUTTER WIRE AND CUSHION BLOCK ASSEMBLY FOR A BRICK-CUTTING MACHINE

William R. Martin, Wadsworth, Ohio, assignor to General Wadsworth Brick Corp., Columbus, Ohio

Filed Oct. 25, 1977, Ser. No. 844,890
Int. Cl.[2] B28B *11/14*
U.S. Cl. 83—581.1 **2 Claims**

1. In a brick-cutting machine having an axially rotatable reel which includes a multiplicity of axially rotatable inner hub plates, a plurality of axially extending, outer support bars disposed in radially outwardly spaced relation to said inner hub plates, and formed with a plurality of longitudinally spaced slots, a multiplicity of U-shaped bow springs carried by each of said support bars and having resiliently flexible free end portions extending through and movable within the slots formed in said bars, and a multiplicity of radially disposed cutting

wires carried in tension between said hub plates and the resiliently flexible free end portions of said bow springs; that improvement which comprises a resiliently compressible cushion

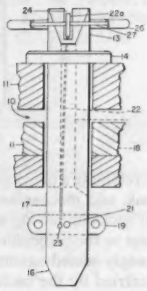


block carried in each of the slots of said outer support bars and arranged to limit rebounding movement of the free end portions of said springs within the slots of said support bars.

4,125,048
HITCH PIN

Russell W. Hardin, Rte. 1, Box 136, Greenfield, Ind. 46140

Filed Sep. 9, 1977, Ser. No. 831,783
Int. Cl.[2] F16B *21/00*
U.S. Cl. 85—3 R **1 Claim**

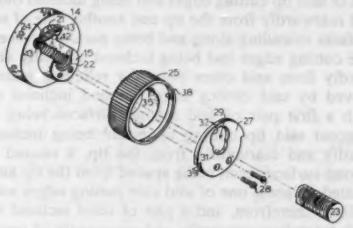


1. A hitch pin having a tubular body carrying an external shoulder adjacent its upper end and having a tapered lower end adapted for insertion in registering hitch apertures, said pin body having a central vertical slot adjacent its tapered lower end, an elongated locking member pivotally supported intermediate its ends within said slot and movable between a retracted position in which the locking member is totally within said slot and a locking position in which the free end portions of the locking member extend beyond the slot, and means for moving said locking member between said positions comprising a rod pivotally connected to said locking member and extending through the central bore of said tubular pin body, the upper end of said rod having a camming portion formed in transversely flattened oval configuration, the upper end of said tubular body being provided with a vertical slot into which said camming portion of the rod recedes when said locking member is moved into its locking position, a handle member forming a closed loop pivotally attached to the pin body and disposed in a plane perpendicular to the plane of said camming portion of said rod, and a transverse member carried by said handle member extending through the camming portion of said rod, whereby as said handle member is moved into its extreme lowered position on either side of said hitching pin the handle is below the upper tip of the pin and said transverse member lowers said rod within the pin body to drive said locking member from its said retracted position to its said locking position.

4,125,049
LATERALLY ENGAGEABLE AND RELEASABLE NUT ASSEMBLY FOR THREADED SHAFTS

Ellie E. Price, Jr., Charlotte, N.C.

Continuation-in-part of Ser. No. 684,486, May 10, 1976, Pat. No. 4,048,897. This application Sep. 13, 1977, Ser. No. 832,955
The portion of the term of this patent subsequent to Sep. 20, 1994, has been disclaimed.
Int. Cl.[2] F16B *37/08*
U.S. Cl. 85—33 **5 Claims**



1. A laterally engagable and releasable nut assembly for a threaded shaft comprising

a nut member having a slot extending outwardly from a central portion thereof toward its perimeter, the inner end of said slot being threaded to match the threads of said shaft and the outer slot end terminating short of said perimeter;

said slot having a width at least equal to the diameter of the shaft to permit the nut member to be laterally inserted into and removed from threaded engagement with the shaft;

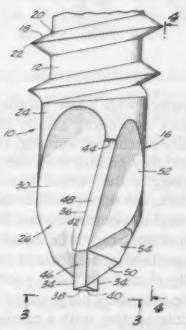
a collar member mounted for rotation on said nut member, said collar member being rotatable in a path surrounding said shaft and traversing the outer portion of said slot, and

cam means on said collar member responsive to said relative rotation of the members for confining said assembly in threaded engagement with said shaft.

4,125,050
SELF-DRILLING SCREW

Irwin J. Schwartzman, Northridge and Paul K. Wilgermein, Van Nuys, both of Calif., assignors to J. Schwartzman Manufacturing & Supply Co., North Hollywood, Calif.

Filed Jun. 6, 1977, Ser. No. 803,801
Int. Cl.[2] F16B *25/00*
U.S. Cl. 85—41 **7 Claims**



1. In a self-drilling screw having an elongated threaded shank with a longitudinal axis and a driving head at its rearward end and a drilling portion having a tip at its forward end, the improvement in which:

(a) the drilling portion comprises a body having longitudi-

nally extending flutes located substantially on opposite sides of said body;

(b) said flutes defining rectilinear tip and side-cutting edges positioned generally on opposite sides of said body, said side-cutting edges and said tip cutting edges intersecting to define an outer point; and

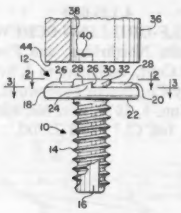
(c) a plurality of planar relief surfaces extending longitudinally behind said tip and side cutting edges, said surfaces each having a planar configuration and including a pair of first surfaces, said first surfaces being contiguous, one of said first surfaces extending along and being parallel to one of said tip cutting edges and being inclined outwardly and rearwardly from the tip and another one of said first surfaces extending along and being parallel to one of said side cutting edges and being inclined inwardly and rearwardly from said outer point for relieving material removed by said cutting edges, second inclined surfaces with a first pair of said second surfaces being located adjacent said tip cutting edge and being inclined outwardly and rearwardly from the tip, a second pair of second surfaces each being spaced from the tip and being located adjacent one of said side cutting edges and being inclined therefrom, and a pair of third inclined surfaces each extending outwardly and rearwardly of one of said side cutting edge outer points and being inclined outwardly and rearwardly of said first pair of said second surfaces and being inclined at a lesser angle with respect to the screw longitudinal axis than said first pair of second surfaces is with respect to the screw longitudinal axis, said third inclined surfaces being located between and separating adjacent ends of corresponding ones of said first and second pairs of said second inclined surfaces and being inclined with respect to said second surfaces.

4,125,051

TAMPERPROOF FASTENER

Daniel J. Herkes, Aurora, and David P. Wagner, Geneva, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Jun. 9, 1977, Ser. No. 805,057
Int. Cl.[2] F16B *23/00*
U.S. Cl. 85—45 **6 Claims**



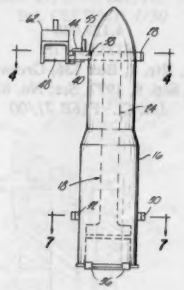
1. A fastener member with a low profile, tamperproof head and a threaded shank depending axially therefrom, said head comprising a radially extending, annular, thin, flange having a thickness not appreciably greater than the pitch of the threads on the shank forming a flat, lower bearing surface and an upper, driving surface, the upper surface including flat surface regions parallel to said lower surface and forming a substantial portion of said upper surface, three equally spaced generally radially extending protuberances formed on said upper surface extending upwardly therefrom, each protuberance including an abutment surface extending perpendicularly upwardly from the upper surface intersecting with a camming surface providing means to only accept and transmit a rotary force in one direction of rotation, each protuberance extending upwardly a short distance not generally exceeding the thickness of the flange, a centrally located annular cylindrical boss, with smooth walls, extending upwardly from the upper surface having a diameter substantially less than the diameter of the flange and a height not substantially greater than the thickness of the flange providing centering and stabilizing means during the driving of the fastener, the flat upper surface region, smooth surfaced short cylindrical boss and three equally spaced protuberances in combination creating means to accurately and predictably align a mating driving tool with the head of the fastener to insure that sufficient torque be applied to the relatively short abutment surface of the protuberances so that the low profile of the head may be maintained insuring that the fastener member will not accept unauthorized removal forces.

4,125,052

AMMUNITION RACK FOR TANK TURRET

Richard J. Thomas, Royal Oak, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 9, 1977, Ser. No. 794,909
Int. Cl.[2] F41H *7/06*
U.S. Cl. 89—34 **2 Claims**



1. Mechanism for retaining a projectile in an upright position within a military tank: said mechanism comprising a semi-circular open-mouthed backstop having an internal diameter that is essentially the same as the projectile diameter, whereby the projectile can be snugly seated against the backstop without wobble; a bracket carried by the backstop; a pawl swingably mounted on the bracket for movement between a first position obstructing removal of the projectile from the backstop, and a second position permitting removal of the projectile from the backstop; a solenoid mounted on the bracket remote from the pawl swing axis; a solenoid armature operatively connected to the pawl for drawing same away from the mouth of the backstop to its second position when the solenoid is energized; and spring means for projecting the pawl to its second position when the solenoid is de-energized; the mouth opening of the backstop lying in a plane (60) that substantially intersects the axis of the seated projectile; the swing axis of the pawl being located forwardly and laterally of the backstop mouth opening; the pawl having a projectile-engagement surface that moves substantially parallel to the plane of the backstop mouth opening as the pawl approaches the projectile surface; the location of the pawl swing axis being such that the pawl can be pushed aside by the projectile as the projectile is moved to a position seated against the backstop.

4,125,053

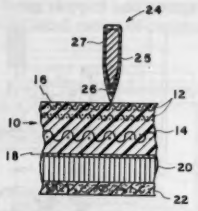
ARMOR

George Lasker, Claremont, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Division of Ser. No. 518,688, Oct. 29, 1974, Pat. No. 4,111,097.
This application Jan. 12, 1976, Ser. No. 648,846
Int. Cl.[2] F41H *5/04*
U.S. Cl. 89—36 A **5 Claims**

1. A method of defeating an armor piercing bullet comprising the steps of:

stripping the bullet to the core thereof by passing it through a steel wire mesh;



fracturing the stripped bullet core by passing it through a tungsten wire mesh; and

absorbing the energy of the fractured bullet core.

4,125,054

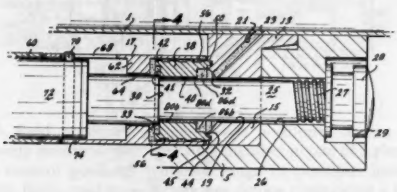
MECHANISM FOR GAS CONTROL IN AN AUTOMATIC FIREARM

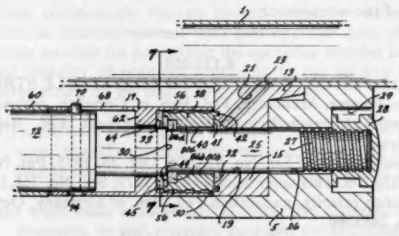
Fred L. Jennie, Anaheim, Calif., assignor to Weatherby, Inc., South Gate, Calif.

Continuation-in-part of Ser. No. 726,939, Jul. 30, 1976. This application Feb. 22, 1977, Ser. No. 770,470

Int. Cl.[2] F41D *5/08*

U.S. Cl. 89—193 **7 Claims**





1. In a gas operated firearm having a gas operated cylinder for operating the action of the firearm, a receiver cylinder within which the gas operated cylinder has sliding engagement, there being channel means for conveying gas from the barrel of the firearm to the receiver cylinder, the improvement comprising the receiver cylinder being constructed to provide means for regulating a flow of gas through the channel means to the gas operated cylinder, the receiver cylinder having axial passageway means positioned to restrict the flow of gases to the gas operated cylinder, the receiver cylinder having a bore having sliding engagement with a shaft, there being axial passageway means positioned between said shaft and the inside of said bore of the receiver cylinder.

4,125,055

CONTROL SWITCH FOR AMMUNITION SELECTION FOR WEAPONS

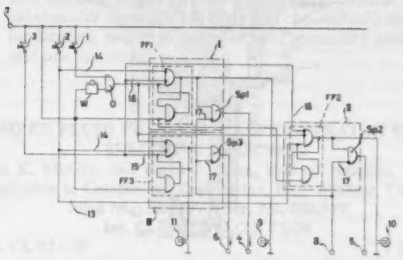
Gunther Hesse, Wolfershausen; Manfred Strassnitzki, Vellmar, and Helmut von Dolsperg, Hann.-Münden, all of Germany, assignors to Wegmann & Co., Kassel, Germany

Filed Mar. 9, 1977, Ser. No. 776,054

Claims priority, application Fed. Rep. of Germany, May 5, 1976, 2619783

Int. Cl.[2] F41G *11/00*

U.S. Cl. 89—33 SF **6 Claims**



1. A control switch for applying an input signal to a fire direction computer to indicate the selection of one of a plurality of types of ammunition which can be selectively fired, the control switch comprising:

a plurality of actuatable switches each corresponding to one type of ammunition; and

a plurality of flip-flops each corresponding to one switch and each having a setting input connected to the associated switch and settable in response to the actuation thereof and each having at least one resetting input connected to the remaining switches and resettable in response to the actuation of any one thereof;

whereby only one flip-flop is set at a given time and only one flip-flop output applies an input signal to the fire direction computer indicating the desired ammunition.

4,125,056

SPINDLE STRUCTURE FOR GEAR SHAPING MACHINE OR THE LIKE

Erich Tlaker, and Harold G. Haseltine, both of Springfield, Vt., assignors to Fellows Corporation, Springfield, Vt.

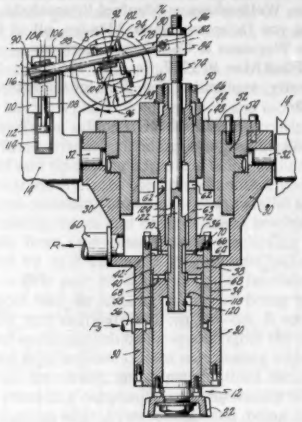
Filed Jan. 10, 1977, Ser. No. 758,350

Int. Cl.[2] B23F *9/04*

U.S. Cl. 90—7 **13 Claims**

1. A fluid operating and control mechanism for axial reciprocation of a spindle in a machine tool having a cylinder and wherein the spindle comprises a piston slidable in the cylinder and having first and second faces of respectively smaller and larger area, said spindle being provided with an axial bore, a valve reciprocable in said spindle bore and cooperating with the spindle to define first and second fluid passages in the spindle bore, conduit means including a pressure line for connection with a source of fluid under pressure and a drain line for returning fluid to the source at low pressure, the pressure line being arranged continuously to direct fluid against said first face, said first passage being disposed between said first and second faces and said second passage being disposed between said second face and said drain line, said valve being reciprocable in said first and second passages and arranged when moved in one axial direction to open said first passage and close said second passage and thereby cause movement of the spindle in said one axial direction in its working stroke and when moved in the opposite axial direction to close said first

passage and open said second passage and thereby cause spindle movement in the said opposite axial direction in its return



stroke, and mechanical drive means for reciprocating said valve.

4,125,057

PLANETARY MILLING MACHINE

Kris E. Cox, 1125 W. 190 St., Gardena, Calif. 90248

Filed Mar. 31, 1976, Ser. No. 672,294

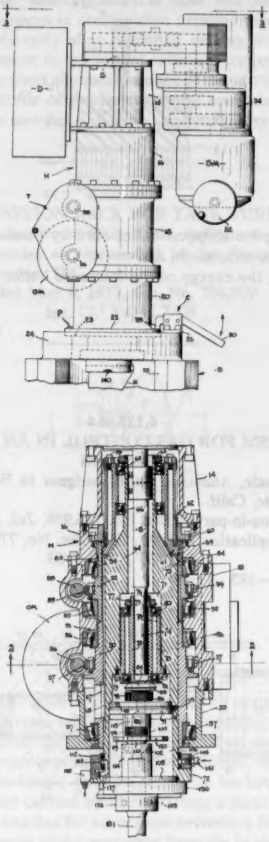
Int. Cl.[2] B23C *3/32*

U.S. Cl. 90—11.58 **23 Claims**

1. A rotary tracking machine for moving a work contact member along a conical surface of a workpiece comprising central drive means including a generally radially extensible arm carrying said work-contact member movable in a planetary path by said drive means, a pair of separately operable guidance elements for selectively positioning the work-contact member, one of which elements is adapted to guide the member annularly and the other to guide it axially and jointly the two elements being adapted to guide the member in a helical track at a predetermined pitch,

gear train means adapted to operatively couple the pair of guidance elements and jointly drive them with a velocity ratio dependent upon the particular gearage of the gear train means, which ratio thus determines the pitch of the helical track followed by the work-contact member, and may be changed by substituting different gearage elements in said gear train means and thereby change said pitch, and

means responsive to joint operation of the guidance elements for progressively changing the amount of radial extension of said arm, whereby the helical track followed by the



work-contact member may conform to the conic surface of the workpiece.

4,125,058

AXIAL PISTON MACHINE FOR ADJUSTABLE STROKE

Franz Forster, Mühlbach, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Hollriegelskreuth, Fed. Rep. of Germany

Continuation of Ser. No. 625,096, Oct. 23, 1975, Pat. No. 4,026,195. This application Feb. 7, 1977, Ser. No. 766,150

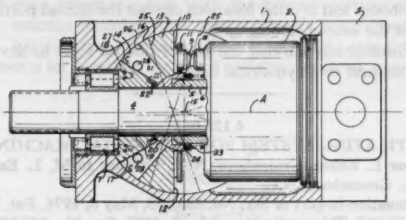
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1974, 2451380

Int. Cl.[2] F01B *13/04*

U.S. Cl. 91—506 **5 Claims**

1. In an axial piston machine having a hydraulic control means for setting the stroke of the pistons of a cylinder drum rotatable about a first axis, the pistons bearing against a piston-running surface inclined to said first axis, said piston-running surface being formed on a rocker having a cylindrical surface rotatable against a cylindrical countersurface of a machine housing and centered upon a second axis perpendicular to said first axis, the inclination of said piston-running surface to said first axis being adjustable by said hydraulic means by rotation of said rocker about said second axis, the improvement wherein said hydraulic control means includes a hydraulically displaceable swinging-vane drive coaxial with said second axis and acting upon said rocker, said swinging-vane drive having

a hydraulically pressurizable compartment, said rocker defining a wall of said compartment, said cylindrical countersurface of said housing being stepped and comprising a first surface portion of relatively small radius of curvature proximal to said



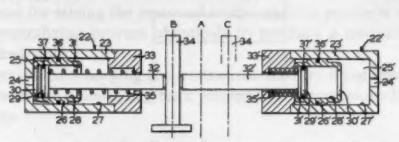
first axis and a second surface portion coaxial with said first portion and lying outwardly thereof with respect to said first axis, said wall lying between said cylindrical surface of said rocker and said second surface portion.

4,125,059

FLUID PRESSURE OPERABLE SERVO POSITIONER

Hirokazu Tuji, Kobe, Japan, assignor to The Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Jan. 14, 1977, Ser. No. 759,445
Claims priority, application Japan, Apr. 5, 1976, 51-38442
Int. Cl.[2] F01B *7/20*
U.S. Cl. 92—51 **2 Claims**



1. A fluid pressure operable servo positioner device for selectively positioning an operating member in one of a plurality of control positions within a range of positions having opposite limits, said servo positioner device comprising a pair of operating units diametrally opposingly arranged on opposite sides of the operating member and each including piston means independently subjectable to fluid pressure and movable in one direction responsively thereto toward respective extended positions in abutting contact with said opposite sides of the operating member for positioning the operating member in one of said plurality of positions according to the relative fluid pressures acting on the respective piston means,

(a) said piston means being operable:

(i) when both are subjected to respective equal fluid pressures, to said extended positions for engaging and maintaining the operating member in a central neutral position,

(ii) when each is subjected to respective different fluid pressures, to said extended positions for engaging and maintaining the operating member in a preselected position, on one side or the other of said neutral position, according to the relative degree of said different pressures,

(iii) or when both are relieved of all fluid pressure, to respective retracted positions out of contact with said operating member which may be manually operated to any one of said plurality of positions free of contact with the piston means,

(b) said operating units each including a cylindrical casing for the respective piston means,

(c) each of said piston means comprising:

(i) a primary piston reciprocably operable in said casing between first axial limits;

(ii) a secondary piston coaxially telescopically operable within said primary piston between second axial limits greater than said first axial limits; and

(iii) respective spring means for biasing said primary and secondary pistons toward said retracted positions; and

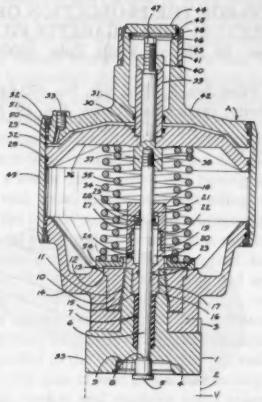
(d) each of said cylindrical casings having a pressure chamber formed therein adjacent said piston means and chargeable with fluid pressure at respective preselected degrees, each of said primary pistons being provided with a concentric opening at one end adjacent said pressure chamber via which opening fluid pressure may flow from said pressure chamber to act on the respective secondary pistons and each of said primary pistons has an annular internal shoulder formed at the other end opposite said one end for limiting said axial travel of said secondary piston in said one direction.

4,125,060

DAMPED FLUID PRESSURE VALVE OPERATOR WITH SELECTIVE BACK SEAT

John K. McGee, and Floyd J. Lane, both of Houston, Tex., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed May 24, 1977, Ser. No. 800,019
Int. Cl.[2] F15B *15/22, 15/24*
U.S. Cl. 92—59 **1 Claim**



1. In a fluid pressure-powered actuator for operating a valve or the like by a push-pull motion, apparatus comprising:

a housing enclosing a chamber, and including means defining a bore communicating through the housing with the chamber;

a piston slidably received in the chamber;

means for admitting pressurized fluid to the chamber on one side of the piston for urging the piston to slide along in one direction therein;

compression coil spring means received in the chamber and reacting against the housing and the opposite side of the piston for urging the piston to slide along in the opposite direction therein from said one direction;

an actuator stem received in said chamber and passing out thereof through said bore;

fluid-filled dashpot-type shock absorber means between the actuator stem and the housing for damping attempted rapid axial movement of the actuator stem;

a packing annulus sealing between the actuator stem and the housing contiguous with said bore;

means defining a coaxially annular seat on said housing circumferentially of where the actuator stem emerges from said bore;

means defining a coaxially annular shoulder on said actuator stem, for engagement with said annular seat upon movement of said piston in said opposite direction until said

shoulder abuts said seat, to provide a seal between the actuator stem and the housing independently of said packing annulus;

a spacer element removably interposed wholly within the housing between the piston, on said one side thereof, and said housing, for preventing, only while installed, the piston from sliding sufficiently in said opposite direction to engage said seat with said shoulder; said housing including removable access cover means situated to permit installation and removal of said spacer element; and

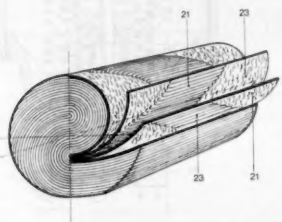
surface means on said actuator stem, axially beyond said shoulder, for connecting said actuator stem to such device as is to be pushed and pulled thereby, said piston including an axially elongated extension projecting axially oppositely of said actuator stem; said housing including a top end wall having an axially outwardly extending tubular neck portion; said access cover means being removably secured on the outer end of said tubular neck portion; said tubular neck portion having means defining a circumferentially extending axially outwardly facing annular seat formed internally thereof near the outer end thereof; said spacer element being constituted by a disk seated on said annular seat and retainer means within said neck retaining said disk on said annular seal.

4,125,061

METHOD FOR THE PRODUCTION OF FILTER STRUCTURE FOR CIGARETTE FILTERS

Ernest Goavec, 16 Bis rue Emile Zola, 66004 Perpi Gnan, France

Filed Jun. 1, 1976, Ser. No. 692,010
Claims priority, application France, Jun. 19, 1975, 75 19233
Int. Cl.[2] A24C *5/50*
U.S. Cl. 93—1 C **8 Claims**



1. A method of forming a continuous cylindrical filter casing for cigarettes comprising:

a. continuously paying out an endless sheet of absorbant fibrous material with transverse corrugations;

b. rigidifying a series of first shaped portions of the sheet so as to define a predetermined geometric configuration which is repeated in the sheet longitudinal direction in accordance with a first repetition sequence and in the sheet transverse direction in accordance with a second repetition sequence, this rigidity being obtained by crushing corrugation ribs and forming on said first portions fine waffle-like longitudinal flutings, while leaving intact corrugated material of second portions of the sheet;

c. continuously cutting out lengths of ribbon in the longitudinal direction of the sheet of equal width, such that the segments of said first and second portions of each cut-out ribbon forms a motif repeated in the longitudinal direction of the ribbon in accordance with the longitudinal repetition sequence of the sheet;

d. continuously pivoting these ribbons by 90° over their central axis;

e. assembling these ribbons to form a ribbon pile so that the segments of each ribbon located in this pile between two perpendicular planes in the longitudinal direction of the ribbon and of a longitudinal dimension equal to the first repetition sequence of the motif is uniformly repeated in the longitudinal direction of the ribbon, the relationship between the width of the ribbons and said second repetition sequence being selected such that, for two continuous ribbons of the pile, the first portions of a first ribbon in certain locations contact the first portions of the second ribbons and in other locations contact the second portions of the second ribbon; and,

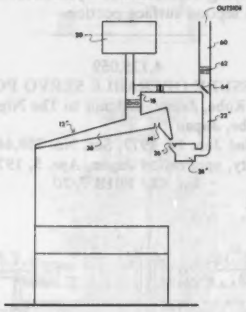
f. continuously curving the pile of ribbons so as to have it conform to a cylindrical casing.

4,125,062

VENTILATING SYSTEM FOR INDUSTRIAL MACHINES

Marion L. Eakes, Greensboro, N.C., assignor to M. L. Eakes Co., Greensboro, N.C.

Continuation-in-part of Ser. No. 683,733, May 6, 1976, Pat. No. 4,050,367. This application Jul. 22, 1977, Ser. No. 817,987
Int. Cl.[2] F23J *11/00*
U.S. Cl. 98—115 LH **1 Claim**



1. An improved process for collecting, cleaning up and disposing contaminated exhaust gases generated at a work table comprising the steps of:

(a) collecting the contaminated exhaust gases in an exhaust hood having a longitudinally extending inlet above at least one edge of said work table by applying negative pressure to said inlet thereby entraining said exhaust gases at a capture point below said inlet and above said work table;

(b) directing said collected gases toward a gas separating means between said collecting point and the outside atmosphere;

(c) drawing off a portion of said collected gases upstream of said gas separating means;

(d) mixing a prescribed portion of fresh, untreated outside air with the gases drawn off in step (c);

(e) returning and directing said mixture of outside air and drawn off portion of contaminated gases generally upwardly toward said inlet as an air stream from a nozzle positioned closely adjacent, but slightly downwardly and outwardly from said inlet;

(f) whereby said returned air stream causes the capture point of the contaminated exhaust gases to be lowered, and the capacity of said gas separating means to be reduced.

4,125,063

CONTINUOUS DIGESTER

James W. Jelks, Rte. 4, Box 6, Sand Springs, Okla. 74063

Filed Dec. 2, 1977, Ser. No. 857,010
Int. Cl.[2] A23N *17/00*
U.S. Cl. 99—471 **8 Claims**

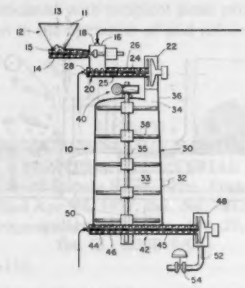
1. Apparatus for the continuous chemical conversion of cellulosic material to a digestible ruminant feed which comprises:

means for rapidly and intimately mixing cellulosic material

at atmospheric pressure with steam and acidic process chemicals at an elevated pressure;

a reactor housing providing a vertical reaction chamber, an inlet port in open communication with the upper portion of said vertical reaction chamber, and an outlet port in open communication with the bottom portion of said reaction chamber, said reactor housing being capable of withstanding operating pressures of 3 to 10 atmospheres;

means for directing the mixed cellulosic material, steam and



acidic process chemicals at the elevated pressure to the reaction chamber through the reactor housing inlet port;

means for removing the acidic reaction products from the outlet port of the reactor housing;

means for mixing the removed acidic reaction products with neutralizing process chemicals to produce a neutralized feed; and

means for discharging the neutralized feed from the apparatus while maintaining back pressure on the reaction chamber.

4,125,064

JUICE SQUEEZER FOR CITRUS FRUITS

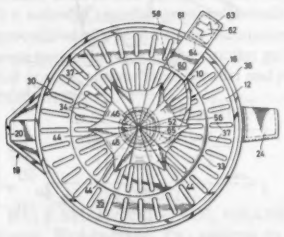
Peter Ackeret, Kusnacht, Switzerland, assignor to Zyliss Zysset AG, Lyss, Switzerland

Filed Oct. 6, 1976, Ser. No. 730,294

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1976, 2635577

Int. Cl.² A47J *19/02*

U.S. Cl. 99—508 **31 Claims**



1. A juice squeezer for squeezing citrus fruits, the squeezer comprising a generally conical squeezer member, a strainer beneath the squeezer member for retaining the flesh of the fruit squeezed out with the juice, a juice-collecting housing supporting the strainer, and a cleaning element overlying the strainer for clearing away the flesh of the fruit retained by the strainer from the immediate area of the squeezer member from which the juice is drained, the cleaning element being movable and all of the squeezer member, the strainer and the collecting housing are stationary.

4,125,065

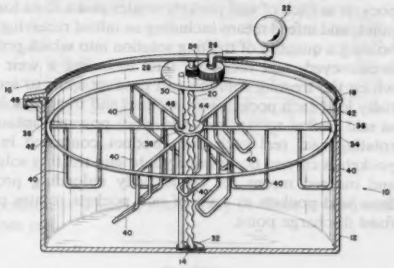
COMBINED COOKING, DRAINING AND MASHING DEVICE

Connie M. Lee, Rte. #1, Box 145 A, Subiaco, Ark. 72865

Filed Oct. 3, 1977, Ser. No. 838,641

Int. Cl.² A47J *19/04*

U.S. Cl. 99—348 **4 Claims**



1. A combined cooking, draining and mashing apparatus for food which comprises a pot having cylindrical sides, a flat bottom and an open top and capable of being heated in order to cook food therein; a removable lid capable of fitting snugly on said open top of said pot; drain means provided on said lid; rotatable crank means rotated exterior to said lid; rotatable mashing means within said pot for mashing said food, and gear means to connect said crank means to said mashing means; wherein said mashing means includes a threaded center rod having an upper end connected to the center of the interior of said lid and extending vertically downwardly therefrom and terminating in a lower end, a pivot rod having an upper end connected to said gear means and extending downwardly therefrom parallel to said center rod and terminating in a lower end, whereby said pivot rod is turned about said center rod by said crank means, a removable center wheel having a first circular opening for receiving said pivot rod and a second oblong opening for receiving said center rod, whereby said center wheel is adapted to turn and move downwardly and upwardly, a plurality of spokes extending outwardly from said center wheel parallel to the bottom of said pot and terminating at ends adjacent the side of said pot, a connecting ring linking said ends of said spokes and mashing teeth extending downwardly from said spokes.

4,125,066

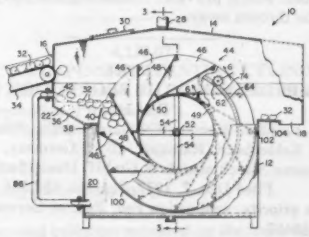
APPARATUS FOR FACILITATING SEPARATION OF PEEL FROM PRODUCE

Thomas P. Stokes, East Wenatchee, Wash., assignor to Tree Top, Inc., Wenatchee, Wash.

Filed Jan. 31, 1977, Ser. No. 763,920

Int. Cl.² A23N *7/01*

U.S. Cl. 99—534 **10 Claims**



1. A device for facilitating separation of peel from product, comprising:

a liquid holding tank having an infeed end and a discharge end, said tank containing a treating solution,

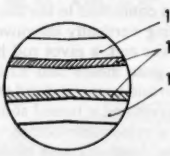
a holding reel suspended for rotation in said tank through said treating solution, said reel having a cylindrical hub and a series of open-ended pockets spaced around said cylindrical hub and extending outwardly therefrom between a pair of annular sidewalls,

infeed means for sequentially loading said product into said pockets as each of said pockets rotates past a fixed loading point, said infeed means including an infeed receiving tank holding a quantity of treating solution into which product is conveyed, said receiving tank including a weir over which the treating solution and product spills to sequentially load each pocket with product and treating solution as said pocket rotates past said weir; powered means for rotating said reel such that product contained in said pockets is carried downwardly into said treating solution; and outfeed means for sequentially unloading product from said pockets as each of said pockets rotates past a fixed discharge point.

4,125,067
MACHINE FOR WASHING, SELECTING, CLEANING AND SLICING THE STEMS OF MUSHROOMS

Alessandro Peruffo, and Renzo De Barba, both of Vicenza, Italy, assignors to TEIMEX A.G. IMP-EXP Teilmetallbau, Liechtenstein

Filed Dec. 13, 1976, Ser. No. 749,628
Claims priority, application Italy, Dec. 24, 1975, 85643/75
Int. Cl.[2] A23N *15/02*; A47J *21/00*
U.S. Cl. 99—639 **12 Claims**



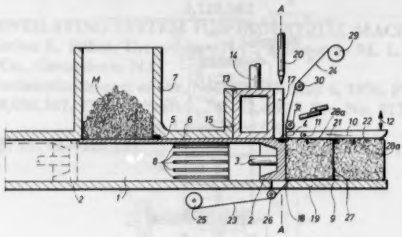
1. A machine for washing, sizing and cutting the stems of mushrooms which comprises a tub full of water into which the fresh mushrooms to be treated are poured in bulk, a second tub, means for conveying the mushrooms from the first tub into the second tub, a selector device for sizing the mushrooms, means for lifting the mushrooms onto said selector device and a plurality of inclined channels located under said selector device, means for carrying the mushrooms onto said inclined channels, said selector device consisting of a plurality of rotating belts divergently arranged whereby spaces of progressively increasing width are formed between the belts and the mushrooms fall the more advanced the bigger the size into positions on said inclined channels, a cutting device, guides for transporting the mushrooms towards the cutting device with their stems downwards said cutting device being constituted by first endless toothed belt which provides for cutting the dirty end of the stem to be thrown away.

4,125,068
BALING PRESSES FOR THE PRODUCTION OF BOUND BALES

Wilhelm Linnerz, Kaarst; Eberhardt Stodt, Düsseldorf, and Erwin Kaldenbach, Ratingen, all of Germany, assignors to Lindemann Maschinenfabrik GmbH, Düsseldorf, Germany

Filed Dec. 7, 1977, Ser. No. 858,354
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1976, 2656457
Int. Cl.[2] B65B *13/04*
U.S. Cl. 100—19 R **4 Claims**

1. In a baling press for the production of bound bales of scrap material, said press comprising a press box, a press plunger, means mounting said press plunger for movement through said press box, a mechanism for moving said press plunger in a forward pressing movement through said press box and a retracting rearward movement out of said press box, a scrap material supply hopper, means defining an outlet from said hopper into the top of said press box, means on said plunger closing said outlet as said plunger is moved forwards through said box in a pressing movement, a press channel extending from said press box for receiving bales pressed in said press box by said plunger, and a binding mechanism disposed between

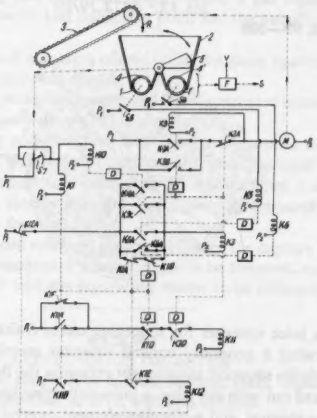


said press box and said press channel, the improvement comprising a separator slide, means movably mounting said separator slide between said press box and said press channel and between said binding mechanism and said outlet of said hopper for movement transverse to said movement of said plunger, and means for moving said slide between an operative position in the path of said plunger and a retracted position clear of said path, said slide, when in said operative position, forming an abutment against which said plunger presses said scrap material as said plunger is moved forwards in a pressng movement.

4,125,069
CONTROL SYSTEM FOR REFUSE PELLETIZING PROCESS

George E. Smith, East Amherst, and James D. Siefert, Orchard Park, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jun. 28, 1976, Ser. No. 700,587
Int. Cl.[2] B30B *15/30*
U.S. Cl. 100—45 **6 Claims**



1. In multiple channel refuse compacting apparatus having a refuse feed and a common chute supplied therefrom, said chute including cyclical feed means to alternatively feed said multiple compacting channels, the improvement comprising a con-

trol system for correcting incipient jams, said control system including:

(1) input signalling means coupled to said cyclical feed means for supplying signals indicative of the operation of said cyclical feed means;

(2) drive means coupled to said refuse feed;

(3) a control circuit connected to be supplied by said input signalling means and coupled to control said drive means in accordance with the signals received from said signalling means, whereby, abnormal operation of said cyclical means associated with incipient jams, produces a corrective action in the operation of said refuse feed.

4,125,070

PRESS FOR SQUEEZING JUICE FROM LIGNEOUS PLANTS AND MATERIAL

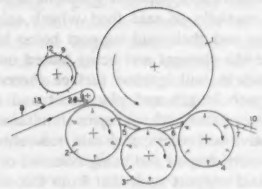
René J. Besnard, 32 Rue de Brest, Vitre, France (35500)

Filed Apr. 26, 1977, Ser. No. 791,043

Claims priority, application France, Apr. 27, 1976, 7613075

Int. Cl.² B30B *9/06*

U.S. Cl. 100—116 **5 Claims**



1. A press suitable for squeezing out the juice contained in plants or ligneous materials, the fibers of which have a diameter of the order of a few millimeters, the fibers being cut into short pieces, said press comprising a pressure roller having a substantially smooth surface and a relatively large outside diameter, a plurality of cylindrical satellite rollers cooperatingly mounted adjacent and in contact with said pressure roller, the material to be pressed passing between the pressure roller with said substantially smooth surface and the plurality of satellite rollers, each of said satellite rollers having a lateral surface with a series of circular grooves formed thereon, the base of the grooves being open to allow the squeezed-out liquid to pass between two grooves, and the circular grooves have at least the initial portion of their faces parallel and perpendicular to the axis of the roller.

4,125,071

BALE SHAPE CONTROL MEANS

Robert G. Young, Bird-in-Hand, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 5, 1976, Ser. No. 711,893

Int. Cl.² B30B *9/30*

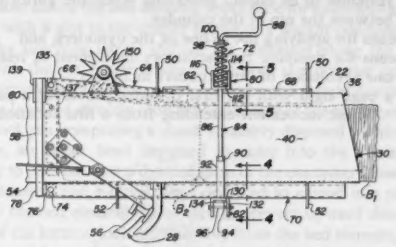
U.S. Cl. 100—191 **5 Claims**

1. Improved bale shape control means for a baler bale chamber within which bales are successively formed and moved toward a rear discharge end thereof, comprising:

a top tension rail having front and rear portions articulately interconnected together;

an elongated, generally straight bottom tension rail; and

means on said bale chamber for effectuating disposition of said rear portion of said top rail in a position in which it is spaced above and substantially parallel to said bottom rail and disposition of said front portion of said top rail in a



position in which it rearwardly declines toward said bottom rail.

4,125,072

WORKPIECE TURNING DEVICE

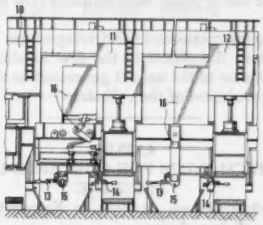
Karl Maier, Kuchen, and Herbert Höhn, Uhingen, both of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

Filed Oct. 4, 1976, Ser. No. 729,175

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1975, 2544203

Int. Cl.² B30B *15/30, 15/32*

U.S. Cl. 100—207 **16 Claims**



1. Workpiece turning device for an automated press line of the type where workpieces are turned after being withdrawn from a working chamber of a press and are then subsequently fed to a further press, said turning device comprising:

reversing gripper means having two separate gripper arms and clamp means movable with said gripper arms for selectively clamping a workpiece therebetween;

a separately controllable gripper arm operating means for controlling the movement of each of said gripper arms;

and rotary unit means for rotatably moving said gripper means, inclusive of said two gripper arms and associated gripper operating means.

4,125,073

IMPACT DAMPING OF PRINTING CYLINDERS

Lawrence J. Bain, La Grange, Ill., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Nov. 9, 1977, Ser. No. 849,775

Int. Cl.² B41F *5/00*

U.S. Cl. 101—216 **14 Claims**

1. A printing press comprising

a frame;

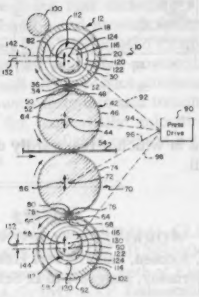
first and second cylinders mounted on the frame for rotation about generally parallel axes, the first cylinder having a lockup gap on the periphery thereof for receiving the ends of a member, placed about the first cylinder, which define a gutter;

means for rotatably driving the cylinders and initiating oscillatory movement of the first cylinder in a plane defined by the cylinder axes once per revolution of the cylinders in response to an impact generated when the gutter passes between the nip of the cylinder;

means for applying ink to one of the cylinders; and

means for damping the oscillatory movement in less than one revolution of the cylinders including

a cage rigid with the first cylinder providing a path of object movement extending from a first location to a



second location and providing a substantial component of object movement in the plane when the gutter passes between the nip of the cylinders;

an object in the cage moveable from the first to the second location in response to the impact and thereafter oscillatable out of phase with respect to the cylinder oscillations;

the damping means and the driving means being arranged to return the object to the first location prior to the occurrence of the impact generated on the next successive revolution of the cylinders.

4,125,074

FEED MECHANISM FOR PORTABLE LABELING MACHINE

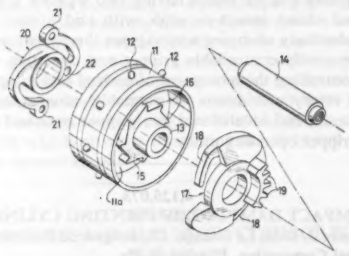
Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan

Filed Apr. 7, 1977, Ser. No. 785,357

Claims priority, application Japan, May 4, 1976, 51/056531[U]

Int. Cl.[2] B41F *13/04*

U.S. Cl. 101—288 **14 Claims**



1. A portable labeling machine, comprising:

a machine body; a passageway for a strip of labels in said body; a feed mechanism for feeding labels along said passageway; an actuating lever movable to operate said labeling machine and said feed mechanism;

said feed mechanism comprising:

a feed wheel rotatably mounted in said machine body; label strip engaging elements on said feed wheel and movable along said passageway as said feed wheel rotates for engaging and advancing a label strip; said feed wheel having one longitudinal end; a portion of said feed wheel comprising a sleeve-like element extending coaxially thereof; said sleeve-like element having an interior surface and said feed wheel having additional recesses defined in the interior surface thereof; said recesses being spaced apart the angular distance of rotation of said feed wheel required to move said feed wheel the length of one label;

a ratchet wheel coaxial with said feed wheel and connected thereto to rotate therewith;

a pawl member coaxial with and rotatable with respect to said ratchet wheel; said pawl member including a pawl engageable with said ratchet wheel for rotating said ratchet wheel in one direction as said pawl member rotates in said one direction and for not rotating said ratchet wheel as said pawl member rotates in the opposite direction;

said actuating lever being connected to said pawl member for rotating said pawl member in said one direction and said opposite direction as said actuating lever is moved;

non-return means connected to said feed wheel for blocking rotation thereof in said opposite direction as said pawl member moves in said opposite direction; said non-return means comprises a support secured to said machine body; a pair of flexible, resilient arms extending from said support at diametrically opposed positions around said support and coaxially of said feed wheel; said non-return means arms and their said support being located inside said sleeve-like element and being biased outwardly into said recesses in said interior surface thereof; said arms being of such length and placement and said recesses being so placed that both said arms simultaneously engage in a respective said recess; each said non-return means arm being curvedly shaped and being oriented on and extending from said support such that from the engagement of one said arm of said pair thereof with a said feed wheel recess to the engagement of the other said arm of said pair thereof with a second said feed wheel recess, said non-return means having a generally S-shape.

4,125,075

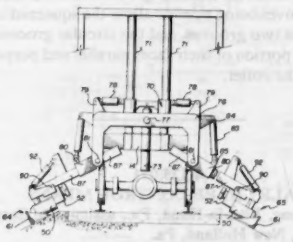
HIGH SPEED PRODUCTION TAMPER COMPACTOR

John K. Stewart, Lexington, S.C., assignor to Canron, Inc., New York, N.Y.

Filed Mar. 18, 1977, Ser. No. 779,227

Int. Cl.[2] E01B *27/17*

U.S. Cl. 104—7 B **11 Claims**

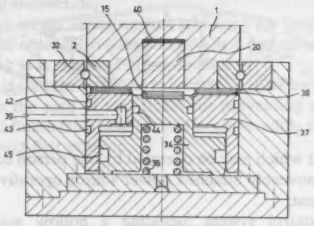


6. Apparatus for reconstituting the structure and the surface of a railroad track comprising a track maintenance vehicle having a frame; compacting means mounted on the vehicle; pressure exerting means mounted between said frame and said compacting means for exerting through the compacting means a continuous inwardly directed pressure independently on each side of the track adjacent the tie ends substantially transversely and from opposite sides of the track, whereby to displace the ballast and raise and horizontally align the track.

4,125,076
POSITIONING DEVICE FOR CARRIAGES MOVABLE ALONG A GUIDE

Gerhard W. Dörfel, and Bernd D. Görner, both of Weilheim, Teck, Fed. Rep. of Germany, assignors to A. Ahlstrom Osakeyhtio, Finland

Continuation of Ser. No. 500,670, Aug. 26, 1974, abandoned, which is a continuation-in-part of Ser. No. 448,509, Mar. 6, 1974, abandoned. This application Oct. 1, 1975, Ser. No. 618,833
Int. Cl.[2] B61B *13/00*
U.S. Cl. 104—165 **5 Claims**

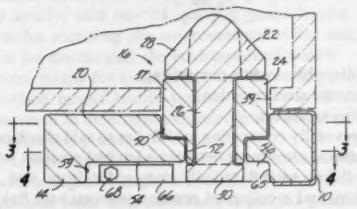


1. In a positioning apparatus of the type in which a carriage is moveable along a guide member and can be selectively coupled to a moveable transfer member for movement thereby along said guide the improvement which comprises a dual locking mechanism borne by the carriage and having a first locking means and a second locking means both fluid powered, said first locking means being operable to engage the guide member to lock the carriage thereto and said second locking means being operable to engage the transfer member to lock the carriage thereto, said first and second locking means having respective pistons actuated concurrently by a common pressurized fluid medium and disposed such that when the fluid medium is at one pressure condition the first locking means engages the guide member and locks the carriage thereto while the second locking means is held in a released state and out of engagement with the transfer member and when the fluid medium is at another pressure condition the first locking means is set in a released state and disengaged from the guide member to allow movement of the carriage therealong while the second locking means is set into engagement with the transfer member to lock the carriage thereto, said pistons being disposed for relative movement in opposite directions and one piston extending through the other.

4,125,077
TWIST LOCK FOR FREIGHT CONTAINERS

George L. Baaso, 31418 Schoenherr, Apt. 4, Warren, Mich. 48093

Filed May 6, 1977, Ser. No. 794,484
Int. Cl.[2] B65J *1/22*
U.S. Cl. 105—366 B **4 Claims**

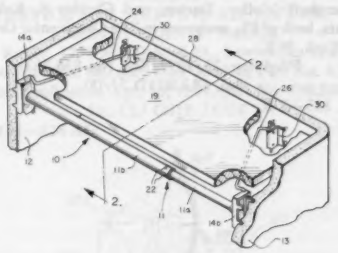


1. Twist lock means for retaining a multi-ton freight container on the bed element (14) of a transport vehicle: said lock means comprising a non-circular opening in the vehicle bed element; a two piece locator-lock pin assembly configured for detachable mounting in said non-circular opening; said locator comprising a sleeve having a lower non-circular retainer portion extendable through the non-circular opening to prevent sleeve rotation, and an upper non-circular operator portion locatable above the bed element upper face for mating engagement with a slot in the corner fitting of a freight container to thereby preclude lateral shift of the container along the bed element; the space surrounding the upper non-circular operator portion being unobstructed, whereby the freight container can be lowered directly onto the upper face of the bed element; said lock pin comprising a shank rotatably disposed within the sleeve, an upper head designed to enter into the container fitting to prevent upward dislocation of the container from the bed element, and a lower head designed to extend in a plane below the bed element lower face to prevent upward dislocation of the locator-lock pin assembly from the bed element; the upper and lower heads on the lock pin being non-circular in plan outline, said heads being angled relative to one another in a non-registering orientation; said lock pin having a first "released" position wherein the lower head registers with the non-circular bed element opening to permit insertional movement of the assembly into the bed element opening; said lock pin having a second "container-unlock" position wherein the lower head underlies the bed element lower face and the upper head aligns with the operator portion of the locator; said lock pin having a third "container-lock" position wherein the lower head underlies the bed element lower face and the upper head extends out of registry with the operator portion of the locator; and spring detent means mounted on the bed element for engagement with the lock pin lower head to releasably retain the lock pin in its "container-unlock" and "container-lock" positions; said detent means being completely disengaged from the lock pin when it is in its "released" position.

4,125,078
CLOTHING ROD/SHELF SUPPORT UNIT

Lawrence M. Nyquist, 3018 N. Spaulding, Chicago, Ill. 60618

Filed Aug. 5, 1977, Ser. No. 822,383
Int. Cl.[2] A47B *61/00*
U.S. Cl. 108—29 **14 Claims**



1. A clothing rod/shelf support unit comprising:
a first extensible clothing rod adapted to extend between a first and a second opposing end wall in the vicinity of a back wall which is between said opposing walls, said rod including means for securing said rod to said opposing walls;
pivotal brackets mounted to said rod extending toward said third wall, said brackets being adapted to support a shelf above said rod; and
means for securing said pivotal brackets to said back wall.

4,125,079

PLEATER FOR FORMING COMPARTMENTS FOR A QUILTED FABRIC

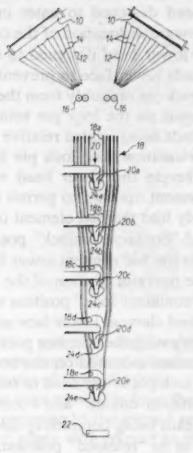
Robert P. Black, Aughton, England, assignor to Isothermic Engineering & Research Limited, Ramsey, Isle of Man

Filed Oct. 18, 1977, Ser. No. 843,328

Claims priority, application United Kingdom, Oct. 22, 1976, 43879/76

Int. Cl.[2] D05B *25/00, 11/00*

U.S. Cl. 112—262 **16 Claims**



1. A method of producing a bag for forming into quilted article comprising the steps of providing strips of flexible material, feeding said strips through respective work stations, providing two sections of flexible material, folding the material of each of said sections to form folded edges therein, pairing said folded edges of one section with said folded edges of the other section, feeding said folded edges of a respective pair side by side and simultaneously through each of said work stations, securing the longitudinal edges of a respective one of said strips simultaneously to said folded edges of said respective pair at each of said work stations, and forming thereby elongate quilting pockets with open ends.

4,125,080

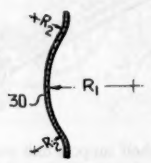
SYSTEM FOR PRODUCTION OF METAL TEAR TABS

Jens Langhoff Moller, Darien, and Charles S. Kubis, Palos Heights, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Filed Sep. 23, 1977, Ser. No. 835,863

Int. Cl.[2] B21D *51/00*

U.S. Cl. 113—1 R **9 Claims**



1. A mechanism for forming pull tabs from soft temper planar stock, said mechanism comprising feed means for sequentially feeding the stock, a series of punch means for sequentially blanking and forming the stock transversely into individual pull tabs, severing means for separating formed pull tabs from the stock, shaping means operable to progressively stiffen the stock in advance of said punch means, and shaping means including cooperating die members shaped to form in the stock at least one continuous rib extending in the direction of stock feed.

4,125,081

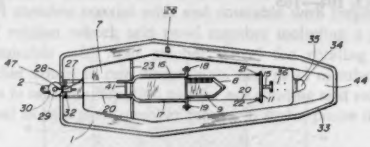
BOAT

Bobby G. Tindal, Rte. 1, Pelion, S.C. 29123

Filed Sep. 28, 1977, Ser. No. 837,614

Int. Cl.[2] B63H *25/00*

U.S. Cl. 114—153 **23 Claims**



1. A boat which may be operated by one person comprising:
(a) a removeably attached power source operative to drive said boat;
(b) a control system including a hollow seat support whereby said control system may be dismantled by folding said hollow seat support;
(c) foot control steering means removeably attached to said boat; and
(d) cable means connected from said foot control steering means through the interior of said hollow seat support to said power source
whereby said boat may be maneuvered by use of said foot control steering means and the preparation for transporting or storing said boat may include removing said foot control steering means, folding said hingedly secured seat, and removing said power source.

4,125,082

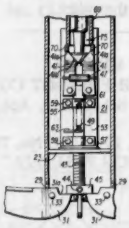
COLLAPSIBLE ANCHOR RESPONSIVE TO THE RATE OF RELEASE OF ANCHOR LINE TENSION

Leslie L. Wolfrey, Box 30, Richardsville, Va. 22736, and Charles H. Brown, Box 22A, Lignum, Va. 22726

Filed Aug. 12, 1977, Ser. No. 824,134

Int. Cl.[2] B63B *21/30*

U.S. Cl. 114—298 **8 Claims**



1. A collapsible anchor comprising:
an elongated shank portion;
a plurality of flukes;
means pivotally connecting said flukes to said shank portion for pivotal movement between a latched position whereat said flukes extend radially outwardly from said shank portion, and a collapsed position whereat said flukes extend generally parallel to the length of said shank portion;
latch means mounted on said shank portion for preventing movement of said flukes from said latched position to said collapsed position;
an anchor line to which tension may be applied; and,
release means responsive to the rate of change of the tension

applied to said anchor line for releasing said latch means whereby said flukes may pivot to said collapsed position;

said latch means comprising:

a latch drive shaft;

means supporting said drive shaft for movement in the axial direction of said drive shaft;

a latch;

means for mounting said latch for pivoting movement on said drive shaft;

a latch spring for biasing said latch toward a first position;

spring means attached to said drive shaft for moving it in a first direction;

further means acting against said latch for limiting movement of said drive shaft in said first direction when said latch is in said first position; and,

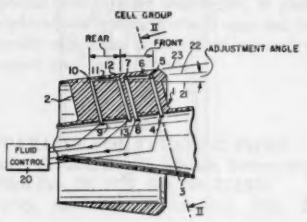
blocking means attached to said drive shaft and extending into the path of said flukes for preventing pivoting of said flukes from said latched position while said latch is in said first position.

4,125,083

DRIVE FOR SUBMERGED FLOATING BODIES

Horst Eichler, Auf den Sande 12, 5400 Koblenz, Fed. Rep. of Germany

Continuation of Ser. No. 473,537, May 28, 1974, abandoned.
This application Jul. 9, 1976, Ser. No. 703,775
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1973, 2330860
Int. Cl.[2] B63H *11/02*
U.S. Cl. 115—14 **10 Claims**



1. A propulsion drive for a watercraft comprising: an enclosed nozzle for passing environmental water axially therethrough in the drive direction including a radially facing reaction surface means for controlling the flow of adjacent environmental water to be acted upon to gain propulsion reaction forces axially; said reaction surface means having a leading portion for receiving the environmental water and a trailing portion for discharging the environmental water;

control means for contracting and expanding said reaction surface means bodily toward and away from the axis between an outermost expanded position and an innermost contracted position;

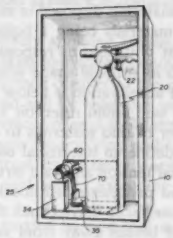
said control means contracting said reaction surface means with a negative angle of attack with respect to a neutral position from said outermost expanded position to said innermost contracted position, and expanding said reaction surface means with a positive angle of attack from said innermost contracted position to said outermost expanded position, as the watercraft moves rectilinearly through the water for generating reaction forces along the axis.

4,125,084

FIRE EXTINGUISHER ALARM

Greg C. Salmonsen, and David C. Pfieffer, both of Owatonna, Minn., assignors to Muckle Manufacturing Division Builders Iron Products, Inc., Owatonna, MN

Filed Sep. 6, 1977, Ser. No. 830,625
Int. Cl.[2] G08B *13/14*
U.S. Cl. 116—99 **10 Claims**



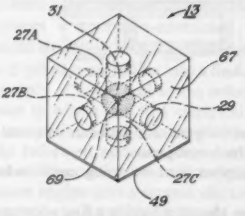
1. An alarm adapted to be associated with a removable fire extinguisher to indicate removal of the same, comprising: a bracket member having a flat base portion and upstanding wall portions normal thereto, said bracket member being adapted to be mounted relative to a fire extinguisher so that the flat base portion is positioned adjacent the base of the extinguisher; a pivoted spring biased flange member having a flat plate and a trigger portion normal thereto mounted on the flat base portion of the bracket member, said flat plate of said flange member being positioned parallel to and adjacent the flat base portion of the bracket member when a fire extinguisher is so mounted that its base rests on the flat plate, said flat plate of the flange member being urged away from the flat base portion of the bracket member when the fire extinguisher is removed; a support mounted on one of the wall portions of the bracket member; and an alarm horn having a self-contained pressurized gas supply coupled thereto mounted in said support, said trigger portion of said flange member being aligned with and adapted to pivot against the gas supply with pivot of the spring biased flange member away from the flat base portion of the bracket member to release gas from the gas supply to sound the horn.

4,125,085

DEVICE FOR SHOWING RECEIPT OF PREDETERMINED SHOCK

Ulyss R. Rubey, 1734 Marblehead St., Lewisville, Tex. 75067

Division of Ser. No. 682,605, May 3, 1976, Pat. No. 4,068,613.
This application Apr. 15, 1977, Ser. No. 788,008
Int. Cl.[2] G01P *15/04*
U.S. Cl. 116—114 AH **7 Claims**



1. A device for affording an indication if a predetermined acceleration has been received by a container, article, object and the like comprising:

a. attachment means for attaching said device to the con-

tainer for monitoring if said predetermined acceleration has been received;

b. measuring means for measuring if said predetermined acceleration has been received; said measuring means being connected with said attachment means and comprising:

i. a structure for holding two materials adjacent each other in a configuration so as to define an interfacial barrier therebetween;

ii. at least two materials disposed in said structure, at least one of said materials being a liquid in the form of a reservoir that will deform responsive to acceleration and return to its original shape when said acceleration ceases if said acceleration is below said predetermined acceleration; said liquid reservoir being disposed adjacent the other of said materials to effect an interfacial tension and define an interfacial barrier therebetween, said interfacial tension and said structure being chosen such that said predetermined acceleration effects rupture of said interfacial barrier such that at least a droplet of said liquid breaks away from said liquid reservoir; said at least two materials having different physical states;

another of said materials comprising a solid; said solid being porous and permeable such that said liquid can invade said solid once said interfacial barrier therebetween has been ruptured; said liquid and said solid being chosen such that a change in color of said solid is effected by invasion of said liquid;

iii. closure sealingly connected with said structure and sealingly holding said materials therewithin so as to prevent flow of said liquid from said structure; and

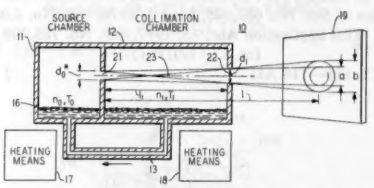
c. indicator means comprising visual means disposed adjacent said porus solid material and said interfacial barrier for indicating when said interfacial barrier has been ruptured by said predetermined acceleration; said visual means being adapted for enhancing the visual indication that at least said droplet has separated from said liquid reservoir.

4,125,086

NOZZLE BEAM TYPE METAL VAPOR SOURCE

John R. Vig, Colts Neck; Erich Hafner, Tinton Falls, and Ronald P. Andres, Princeton, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 6, 1977, Ser. No. 757,261
Int. Cl.[2] C23C *13/08*
U.S. Cl. 118—49.1 **12 Claims**



1. Apparatus for generating a beam of metal vapor to plate a workpiece, which comprises:

a source chamber for containing metal to be vaporized into a beam;

a collimation chamber having a first aperture through which the metal vapor beam passes to impinge upon said workpiece, said source chamber having a small source aperture communicating with said collimation chamber, said apertures being aligned to direct said beam at said workpiece;

means for heating said source chamber to a temperature sufficient to vaporize said metal and to maintain a high metal vapor pressure within said source chamber;

means for heating said collimation chamber to a temperature which at least equals the melting point of said metal, thereby maintaining a relatively low metal vapor pressure in said collimation chamber, the pressure differential between said source and collimation chambers creating a supersonic vapor flow through said source aperture, a substantial fraction of said flow striking the walls of said collimation chamber and condensing to liquid metal, the remaining fraction of said flow passing through said first aperture to impinge upon said workpiece; and

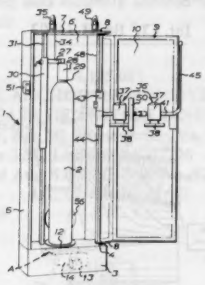
means for recirculating the liquid metal from the collimation chamber to the source chamber against said pressure differential whereat said liquid metal is revaporized, said liquid metal forming a pool communicating with said collimation and source chambers.

4,125,087

APPARATUS FOR CLEANING AND PAINTING GAS BOTTLES

Bengt L. Rönning, Sockerbruksg. 13A, 262 00 Ängelholm, Sweden

Filed Aug. 22, 1977, Ser. No. 826,360
Int. Cl.[2] B05C *1/02*
U.S. Cl. 118—72 **5 Claims**

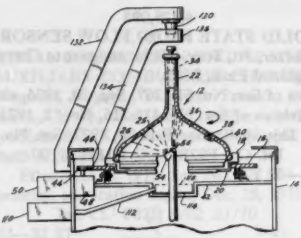


1. Apparatus for cleaning portable gas containers and the like comprising: a rotatable platform adapted to support a gas container, said rotatable platform being slightly tippable with respect to the vertical, motive means for rotating said platform, retainer means for supporting the upper end of a gas container on said rotatable platform against substantial translation while permitting rotation thereof, said retainer means being movable vertically to different positions so as to accommodate gas containers of different sizes to be cleaned, bracket means mounted for swinging movement towards and away from a container supported on said rotatable platform and movable vertically with respect thereto, a pair of laterally spaced apart rotary brushes pivotally mounted on said bracket means for swinging movement towards and away from one another, motive means for driving said rotary brushes, and resilient means normally urging said rotary brushes towards one another, whereby upon swinging said bracket means towards a container on said platform, said rotary brushes engage the container and are moved away from one another in opposition to said resilient means, and upon moving said bracket means vertically with the rotary brushes so positioned the surface of the container can be cleaned.

4,125,088
AUTOMATIC SPRAY COATING MACHINE

Sung D. Hong, Escondido; Ray Boggs, Lemon Grove, and Shinzo Takei, Escondido, all of Calif., assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 21, 1977, Ser. No. 761,420
Int. Cl.[2] B05B 15/04
U.S. Cl. 118—301 37 Claims

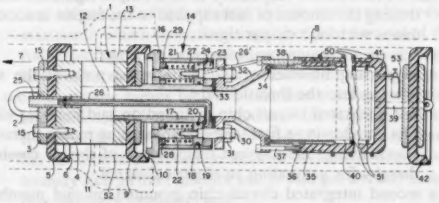


1. A device for coating a predetermined portion of a cathode ray tube envelope including a neck and a flared portion having an open end defined by a peripheral edge about said flared portion, said neck and flared portions defining an inner surface to be coated; said device comprising a frame, a turntable rotatably mounted on said frame, means on said turntable for supporting a cathode ray tube thereon along at least a portion of said peripheral edge, means mounted on said turntable for selectively forming a seal along a predetermined portion of the flared portion of the tube from adjacent said edge inwardly towards the neck for a predetermined distance, and means in said frame for coating said inner surface of the tube, said means for forming a seal preventing said predetermined portion of the tube from being coated and including a flexible sealing element having a peripheral configuration conforming, in plan, generally to the peripheral configuration of said edge and means for selectively laterally expanding said element outwardly against said predetermined portion of the tube.

4,125,089
APPARATUS FOR TREATING PIPES

Peter U. Reusser, Gruebstrasse 25, Meilen, Switzerland

Filed Feb. 28, 1977, Ser. No. 772,921
Claims priority, application Switzerland, Mar. 1, 1976, 2517/76
Int. Cl.[2] B05C 7/08
U.S. Cl. 118—408 6 Claims



1. An apparatus for treating the interior portions of a tubular passage such as a pipeline with a preservative or sealing treatment compound comprising

a body movable through said passage in a predetermined direction, said body having a diameter significantly smaller than said passage;

front and rear axially spaced-apart gaskets carried by said body and extending outwardly to contact the interior surface of said passage and to define a pressure chamber therebetween,

each of said gaskets being cup-shaped and having a flexible radially extending portion and a flexible annular portion extending axially rearwardly;

means for supplying treatment compounded under pressure to said pressure chamber, the annular portion of the front one of said gaskets being forced radially outwardly by said compound under pressure to contact said interior surface; and

means for selectively applying sealing pressure to the rear one of said gaskets to maintain contact of said gasket with said interior surface counter to the pressure of said treatment compound and for relieving said sealing pressure to facilitate movement of said tool through said passage,

wherein said means for applying sealing pressure includes

an annular thrust ring axially displaceable toward and away from said axially extending portion of said rear gasket,

piston means carried by said tool and connected to said thrust ring for moving said thrust ring against said gasket,

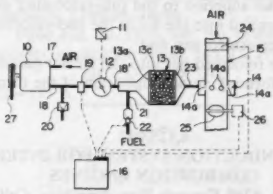
and wherein said means for supplying compound under pressure further includes

means for applying fluid under pressure to said piston means to move said piston means.

4,125,090
CONTROL METHOD AND SYSTEM FOR CAR-MOUNTED FUEL REFORMER

Kunihiko Masunaga, Okazaki; Masakatsu Kani, Toyota; Hirohiko Hoshi, Susono, and Kazuhiko Ishiguro, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 22, 1976, Ser. No. 744,114
Claims priority, application Japan, Nov. 25, 1975, 50-140898
Int. Cl.[2] F02B 43/08
U.S. Cl. 123—3 9 Claims



1. A control method for a car-mounted fuel reformer comprising the steps of:

adjusting a volume of primary air flowing into a reformer, which produces a hydrogen-containing reformed gas through partial oxidation, and simultaneously converting the volume of primary air inflow into a first electric signal;

optimizing a supply of liquid fuel to the reformer by means of a computer to which said first electrical signal is fed;

adjusting the composition and volume of reformed gas produced in the reformer, and simultaneously converting a drawn volume of secondary air to be supplied to an internal combustion engine into a second electrical signal;

feeding said second electrical signal to said computer;

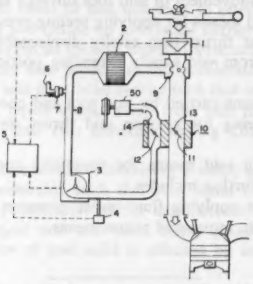
controlling said drawn volume of secondary air by said second electrical signal fed to said computer; and

mixing the reformer gas and the secondary air in appropriate desirable proportions for meeting various driving conditions according to the signals provided.

4,125,091
METHOD AND EQUIPMENT FOR CONTROL OF INTERNAL COMBUSTION ENGINE WITH FUEL-REFORMING DEVICE

Ryuzo Hori, Toyota; Kunihiko Masunaga, Okazaki; Toshio Funayama, Toyota; Hirohiko Hoshi, Toyota; Kazuhiko Ishiguro, Toyota, and Hidetomo Umehara, Susonoshi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 6, 1977, Ser. No. 803,933
Claims priority, application Japan, Nov. 18, 1976, 51-138649; Nov. 18, 1976, 51-138647
Int. Cl.[2] F02B *43/08*
U.S. Cl. 123—3 **17 Claims**

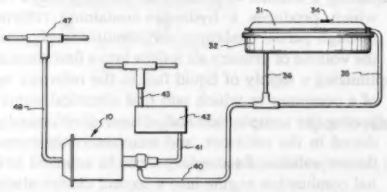


1. A method for control of an internal combustion engine with a fuel-reforming device comprising:
sucking into the engine air under control by a throttle valve without passing through the fuel-reforming device;
supplying air under mechanical control of its volume by a valve interlocked with the throttle valve, to the fuel-reforming device by means of an air pump;
detecting the volume of air not passing through the fuel-reforming device and the volume of air supplied to the fuel-reforming device to find the total air volume sucked into the engine and supplying the volume of fuel matching the total air volume under electrical control into the air;
reacting the air supplied to the fuel-reforming device with the fuel supplied into the air in the fuel-reforming device to yield a reformed gas; and
supplying the reformed gas into the air not passing through the fuel-reforming device, upstream of the throttle valve.

4,125,092
WATER INDUCTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Toshio Inamura, 1740 Kenneth Way, Pasadena, Calif. 91103

Filed Apr. 11, 1977, Ser. No. 786,109
Int. Cl.[2] F02D *19/00*
U.S. Cl. 123—25 B **10 Claims**

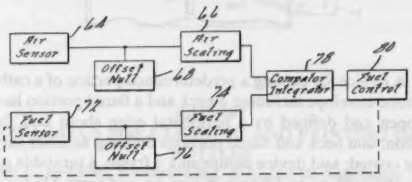


1. A method of controlling the injection of a vaporized air water mixture into the fuel system of an internal combustion engine which comprises providing a vacuum responsive control valve which applies zero vacuum at engine idle speeds and wherein the control valve opens in response to engine RPM to allow the vaporized air water mixture to be drawn by vacuum from the intake manifold from an air bleed line and a water line through orifices into an air water metering assembly, from the metering assembly through the control valve to an exhaust heat exchange heater wherein the water in the air is instantly heated and further vaporized and passed from said heater into the air fuel mixture entering the intake manifold from the carburetor.

4,125,093
SOLID STATE FLUID FLOW SENSOR

George E. Platzer, Jr., Troy, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Continuation of Ser. No. 510,267, Sep. 30, 1974, abandoned, which is a division of Ser. No. 412,216, Nov. 2, 1973, Pat. No. 3,992,940. This application Feb. 28, 1977, Ser. No. 772,884
Int. Cl.[2] F02B *3/00*; F02M *39/00*
U.S. Cl. 123—32 EA **8 Claims**



1. A fuel metering system for maintaining a predetermined mass fuel-air ratio operating parameter between the fuel and air supplied to an internal combustion engine having a throttle body receiving the air and fuel lines conducting the fuel to the engine, said system comprising:
mass air flow sensor means for measuring the mass rate of air flow into the throttle body of the engine and generating an electrical signal in response thereto;
air flow signal scaling means receiving and scaling said air flow electrical signal in accordance with said predetermined mass fuel-air ratio operating parameter;
mass fuel flow sensor means positioned in the fuel delivery lines of the engine for directly sensing and measuring the actual mass flow rate of fuel supplied to the engine and generating an electrical signal in response thereto;
fuel flow signal scaling means receiving and scaling said fuel flow electrical signal in accordance with said predetermined mass fuel-air ratio operating parameter;
control means responsive to said scaled air and fuel signals and generating an output signal representing the amount of fuel required to maintain said predetermined mass fuel-air ratio for the amount of air supplied to the engine; and
fuel control means responsive to said output signal for controlling the amount of fuel supplied to the engine in accordance with said output signal;
said mass air flow sensor means comprising;
a supporting member extending into the path of the air flowing into the throttle body,
a first integrated circuit chip mounted on said member said first chip having a first temperature sensing means thereon responsive to the ambient temperature of the air passing thereby for generating an electrical signal,
a second integrated circuit chip mounted on said member adjacent to said first chip, said second chip having a second temperature sensing means and a chip heating means thereon to heat said second temperature sensing means above the temperature of the air flowing through the throttle body and to maintain the second temperature sensing means at a predetermined temperature level above that of said first temperature sensing means, and
control circuit means electrically connected to said first and second chips and responsive to changes in the mass air flow rate tending to change the predetermined tempera-

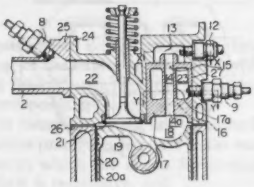
ture level for supplying additional current to said heating means for said second chip to maintain said predetermined temperature level between said first and second temperature sensing means, whereby the amount of current additionally supplied to said heater means is proportional to the mass flow of the air over said second temperature sensing means.

4,125,094

INTERNAL COMBUSTION ENGINE WITH AN AUXILIARY COMBUSTION CHAMBER

Masaaki Noguchi, Nagoya; Yukiyasu Tanaka, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Nippon Soken, Inc., Nishio, both of, Japan

Filed Mar. 3, 1977, Ser. No. 773,934
Claims priority, application Japan, Dec. 25, 1976, 51/157213
Int. Cl.² F02B *3/02, 23/10*
U.S. Cl. 123—32 ST **15 Claims**



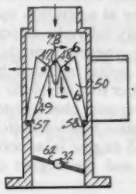
1. An internal combustion engine comprising:
a cylinder block having therein a cylinder bore;
a cylinder head mounted on said cylinder block and having therein two internal areas defining a first auxiliary chamber and a second auxiliary chamber;
an intake valve and an exhaust valve which are movably mounted on said cylinder head;
a piston reciprocally movable in said cylinder bore, said piston and said cylinder head forming therebetween a main combustion chamber into which gas is introduced via said intake valve at the time of the intake stroke;
a high velocity burning jet outlet means communicating said first auxiliary chamber with said main combustion chamber, said outlet means having a cross-sectional area smaller than that of said first auxiliary chamber and also serving as a combustion gas inlet means;
first passage means communicating said second auxiliary chamber with said main combustion chamber;
fuel injection means for injecting fuel into said second auxiliary chamber to form therein an extremely rich air-fuel mixture in which flame is extinguished, the amount of the fuel injected from said fuel injection means being regulated in accordance with the load level of the engine;
second passage means between said first auxiliary chamber and said second auxiliary chamber for leading said extremely rich air-fuel mixture into said first auxiliary chamber to form a combustible mixture consisting of said extremely rich air-fuel mixture and of said gas already in said first auxiliary chamber, and;
ignition means in said first auxiliary chamber for igniting said combustible mixture and directing some of the burning gas into said main combustion chamber via said high velicity burning jet outlet means, a part of said burning gas also entering into said second auxiliary chamber for pushing out said extremely rich air-fuel mixture into said main combustion chamber via said first passage means and for burning the entire extremely rich air-fuel mixture in said main combustion chamber.

4,125,095

CARBURETORS FOR INTERNAL COMBUSTION ENGINES

Jack C. Wilson, Unit 1/2 First Ave., Glenelg East, Australia (5045)

Filed Jun. 22, 1976, Ser. No. 698,787
Claims priority, application Australia, Jun. 25, 1975, PC2118
Int. Cl.² F02M *13/06*
U.S. Cl. 123—106 **4 Claims**



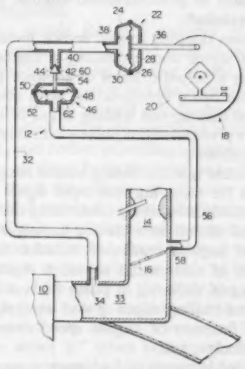
1. An arrangement for controlling of carburation for an internal combustion engine wherein fuel is drawn into an air stream by constriction of a stream of the air so as to be effective in causing a drawing into the air stream of fuel from an outlet, constriction means are arranged so that the degree of effective constriction can be varied, and throttle means are provided including a throttle plate disposed in the air stream downstream of the constriction means, the arrangement being characterized in that the degree of said effective constriction is variable and is varied in accord with changes in engine speed output so that with greater engine speed output there shall be lesser effective constriction and with lesser engine speed output there shall be greater effective constriction, the effective constriction being governed by a vane arrangement positioned relative to a fuel outlet to define constriction means which is controlled by a connection to an engine output speed responsive means .

4,125,096

IGNITION TIMING CONTROL SYSTEM

Kizuku Otsubo, Kokubunji; Akira Murasaki, Musashino, and Takehiko Kita, Tachikawa, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jun. 10, 1976, Ser. No. 694,817
Claims priority, application Japan, Jun. 11, 1975, 50-79671[U]
Int. Cl.² F02D *5/02*
U.S. Cl. 123—117 A **6 Claims**



1. An ignition timing control system in combination with an internal combustion engine including a breaker plate and an intake passageway having a throttle valve rotatably mounted therein, said system comprising a vacuum actuator means for operating said breaker plate and having a first vacuum cham-

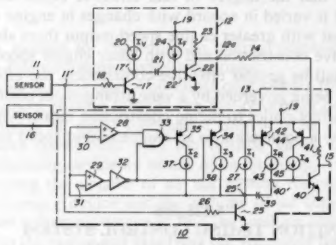
ber in vacuum communication with said intake passageway downstream of said throttle valve in its substantially fully closed position for receiving an engine suction vacuum and operable to retard the ignition timing of said engine in accordance with the vacuum in said first vacuum chamber, passage means communicating with the atmosphere and with said first vacuum chamber to feed atmospheric air thereinto, a control valve means associated with said passage means, a vacuum servo operatively connected to said control valve means and having a second vacuum chamber which communicates with said intake passageway at a position upstream of said throttle valve in its substantially fully closed position and downstream of said throttle valve opened a predetermined amount, said control valve means being operated by the vacuum in said second vacuum chamber to control the amount of atmospheric air fed into said first vacuum chamber to adjust the level of the vacuum therein to cause said vacuum actuator to retard the ignition timing of said engine in accordance with said intake passageway vacuum and the degree of the opening of said throttle valve.

4,125,097

ELECTRONIC IGNITION TIMING ADVANCE CIRCUIT

Philip D. Gunderson, Arlington Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 3, 1976, Ser. No. 747,454
Int. Cl.[2] F02P 5/04, 3/06
U.S. Cl. 123—117 R **20 Claims**



1. An electronic ignition timing advance circuit for an internal combustion engine, comprising:

sensor means for providing an input signal having a frequency and period which are proportional to the speed of an engine, the input signal having leading and trailing edges related to predetermined angular positions of the engine crankshaft;

advance means coupled to said sensor means for receiving said input signal and producing a digital output signal comprising a periodic series of advance pulses, each advance pulse being synchronized with respect to at least one of said leading and trailing edges of said input signal and have a predetermined pulse width related to a variable engine condition;

speed dependent ignition timing means coupled to said sensor means for receiving said input signal and producing, by periodically selectively controlling the rates of change of a signal stored in a device during a predetermined amount of angular crankshaft rotation and utilizing the magnitude of said stored signal, a digital spark timing ignition signal differing in phase from at least one of the leading and trailing edges of said input signal as a predetermined function of engine speed determined by said rates of change; and

means coupled between said advance means and said speed dependent ignition timing means for coupling said advance pulses to said timing means for adjusting said spark timing ignition signal;

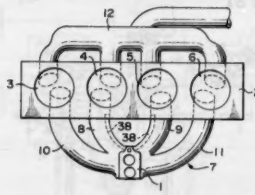
said ignition timing means including first means for altering the magnitude of said stored signal at at least a first rate prior to the occurrence of each of said advance pulses, second means for maintaining the magnitude of said stored signal constant at its last previous value prior to the occurrence of the advance pulses during the advance pulses, and third means for altering the magnitude of said stored signal at a second rate after the occurrence of the advance pulses, whereby the advances pulses effectively delay the transition between said first and second rates and thereby provide a spark timing advance adjustment for the speed dependent spark timing signal according to said variable engine condition.

4,125,098

MULTICYLINDER ENGINE

Yuhiko Kiyota, Nagaokakyo, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Jun. 17, 1976, Ser. No. 697,124
Claims priority, application Japan, Jun. 24, 1975, 50/78132
Int. Cl.[2] F02M 7/00, 13/06
U.S. Cl. 123—119 LR **3 Claims**



1. A multicylinder engine which comprises at least a first cylinder and a second cylinder; a carburetor for supplying a fuel-air mixture leaner than stoichimetric; means defining a first passage connecting said carburetor with said first and second cylinders for flowing said mixture leaner than stoichiometric from said carburetor to said first and second cylinders; rich mixture supplying means for supplying a fuel-air mixture richer than stoichiometric, integral with said carburetor; and means defining a second passage connecting said rich mixture supplying means with said second cylinder for flowing said mixture richer than stoichiometric to said second cylinder; wherein said carburetor includes a primary mixture passage open at one end to the atmosphere for receiving air, and a venturi having a primary fuel nozzle disposed within said primary mixture passage for mixing air flowing through said primary mixture passage with fuel flowing from said primary fuel nozzle; and wherein said rich mixture supplying means includes a rich mixture forming passage opening in said primary mixing passage to the atmosphere upstream of the carburetor venturi, a throttle valve positioned in said rich mixture forming passage to regulate the mixture flow rate therein, a fuel supply passage opening into said rich mixture forming passage at least downstream of said throttle valve, a first valve disposed upstream of said throttle valve for closing said rich mixture forming passage upstream of said throttle valve, a second valve for closing said fuel supply passage, and valve control means for simultaneously opening and closing both said first and second valves at predetermined temperatures.

4,125,099

CARBURETOR WITH FUEL COMPENSATION DEVICE

Hirofumi Nouthuka, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

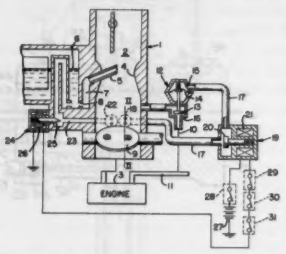
Filed Jul. 6, 1977, Ser. No. 813,239
Claims priority, application Japan, Jul. 7, 1976, 51/79917
Int. Cl.[2] F02M 25/06
U.S. Cl. 123—119 A **7 Claims**

1. A carburetor with a fuel compensation device for an internal combustion engine comprising

a suction passage having a Venturi, a main fuel nozzle fluidly communicating with a float chamber for jetting fuel from the float chamber into the suction chamber, and throttle valve disposed downstream of the main fuel nozzle with respect to a fluid flow flowing in the suction passage,

exhaust gas recirculation means for recirculating an exhaust gas from the engine through the exhaust gas recirculation means, the suction passage, and the engine,

means responsive to vacuum at a position of the suction



slightly upstream of a position of the throttle valve at which idling of the engine is effected, for controlling an exhaust gas flow flowing from the engine into the suction passage corresponding to the vacuum,

auxiary fuel jet means for jetting fuel from the float chamber into the suction passage in response to the same vacuum as the vacuum to which the means for controlling the exhaust gas flow is responsive, and

valve means for controlling both the means for controlling the exhaust gas flow and the auxiary fuel jet means.

4,125,100

METHOD AND APPARATUS FOR CONTROLLING THE OPERATING MIXTURE SUPPLIED TO AN INTERNAL COMBUSTION ENGINE

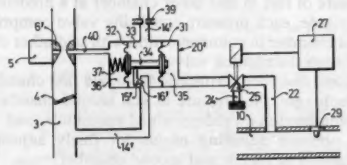
Jürgen Assenheimer, Vaihingen, and Johannes Brettschneider, Ludwigsburg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 18, 1977, Ser. No. 779,102

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1976, 2611409

Int. Cl.[2] F02M *23/04*; F02B *33/00*

U.S. Cl. 123—124 R **7 Claims**



1. In an apparatus for adjusting the composition of a combustible mixture supplied to an internal combustion engine, comprising: a suction tube connected to the engine; means defining a venturi constriction within the suction tube; an apparatus connected to the suction tube for determining the composition of the operating mixture of the engine; and an exhaust gas line connected to the engine, the improvement comprising: an air bypass line connected to the suction tube downstream of the apparatus for determining the composition of the operating mixture of the engine; positioning means; throttle means connected to the positioning means and extending into the air bypass line; an enclosure within which said positioning means is located to define therewith two control pressure chambers separated from each other; means connecting one of said control pressure chambers to the exhaust gas line; further means connecting the other of said control pressure chambers to the most constricted cross sectional area of the venturi defining means; and spring means located in said other of said control pressure chambers, whereby the positioning means has exerted against it the force of said spring means, and in opposition thereto, the subpressure from the most constricted cross sectional area of the venturi and the exhaust gas pressure.

4,125,101

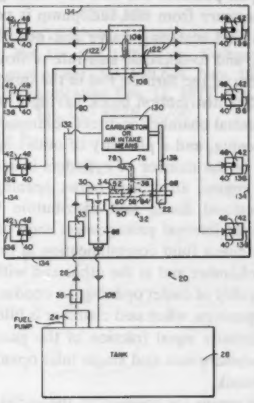
FUEL INJECTION SYSTEM

Hector L. Garcia, Highland Park, and Edward F. Hajdas, Chicago, both of Ill., assignors to Hector L. Garcia, Highland Park, Ill.

Filed Jan. 3, 1977, Ser. No. 756,323

Int. Cl.[2] F02M *41/02*

U.S. Cl. 123—139 AW **46 Claims**



1. A system for converting a gasoline internal combustion engine, said engine being used with a gasoline tank and with a fuel pump for pumping gasoline from said tank at a given pressure with a substantially constant rate of flow, and having a carburetor actuated by a throttle rod, said throttle rod being movable from a closed to an open position to move a throttle valve from a closed to an open position and thereby deliver a mixture of air and gasoline to each cylinder of the engine, into an engine having a fuel injection system actuated by said throttle rod which comprises:

(a) a discharge nozzle for each cylinder of said internal combustion engine, each of said nozzles including a hollow shank having an inlet opening at one end communicating between the exterior and the interior of the hollow shank, the other end of said nozzle shank being closed except for a cylindrically shaped outlet orifice in the wall of the shank, said orifice providing a free and direct liquid flow path at all times from the interior to the exterior of said hollow shank for emission of a narrow spray of finely divided liquid droplets from said discharge nozzle when gasoline under a predetermined operating pressure is introduced into said hollow shank through said inlet opening, said narrow spray having an angle of flare, measured from one side of the spray to the other at a distance from said orifice approximately equal to 40 times the diameter of the orifice and with its vertex at said orifice, that is no greater than about 10° when said nozzle is tested in an ambient vapor pressure of 1 atmosphere with gasoline introduced into the nozzle at said predetermined operating pressure;

(b) a fitting for positioning each discharge nozzle in selective fluid communication with the interior of a given cylinder to project the narrow spray of finely divided liquid droplets emitted from said nozzle into a cylinder head intake

chamber for said cylinder along a path that avoids bringing any substantial quantity of said droplets into contact with the interior walls that define said cylinder's individual passage in an intake manifold of said engine and its associated intake port;

(c) a single, adjustable gasoline metering valve actuatable by movement of said throttle rod, said valve having an inlet opening for receiving gasoline under said given pressure from said fuel pump, and an outlet opening from which metered amounts of gasoline may flow, the amount of gasoline that is permitted to pass through said adjustable metering valve at any given moment being determined by the position occupied by said throttle rod at said moment;

(d) means for operatively connecting said adjustable gasoline metering valve and said throttle rod to increase, in response to movement of said throttle rod from its closed to its open position, the rate at which gasoline flowing under pressure from said fuel pump is permitted to pass through said metering valve and out of its said outlet opening, and to decrease said rate of flow in response to movement of the throttle rod in the opposite direction;

(e) a gasoline distribution block having a single inlet opening, a central chamber in direct communication with said inlet opening, and a plurality of outlet openings equal in number of the number of cylinders in said internal combustion engine, all of said outlet openings having equal cross-sectional areas, said distribution block having a plurality of internal passageways each of which is at all times in direct fluid communication at one end with said central chamber and at the other end with a single one of said plurality of outlet openings to conduct to each of said outlet openings, when said chamber is filled with gasoline, a substantially equal fraction of the gasoline introduced under pressure into said single inlet opening of the distribution block;

(f) conduit means for connecting the outlet opening of said gasoline metering valve directly with the inlet opening of said gasoline distribution block;

(g) conduit means for connecting each of said outlet openings in said distribution block directly to one of the aforesaid discharge nozzles to deliver to said nozzle a metered flow of gasoline under a predetermined operating pressure;

(h) a return fuel line for connection to said gasoline tank to conduct back to said tank any excess, unused gasoline that is pumped from said fuel pump to said adjustable metering valve but because of the action of said metering valve is not permitted to pass through said valve; and

(i) a pressure responsive by-pass valve for connecting the upstream side of said adjustable metering valve with said return fuel line, said by-pass valve allowing the passage of liquid substantially at said given pressure at which gasoline is delivered from said fuel-pump to said gasoline metering valve at said substantially constant rate, and blocking the passage of liquid at pressures substantially below said given pressure,

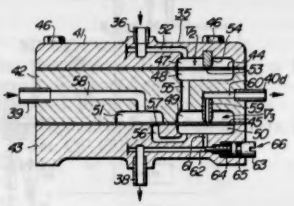
whereby the rate at which said narrow sprays of finely divided liquid droplets of gasoline are emitted from said discharge nozzles of the engine is substantially the same for all said nozzles during the intake phase of the firing cycle of the respective cylinders with which the nozzles are associated, and likewise is substantially the same for all said nozzles during the remainder of the firing cycle of their respective cylinders, and no substantial quantity of liquid gasoline accumulates on or flows down said interior walls that define said individual passages in the intake manifold and said intake ports or accumulates on or flows down the interior walls of said cylinders themselves.

4,125,102

FUEL CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Eizi Tanaka, Anjo; Michihiro Ohashi, Handa; Hiroshi Mochizuki, and Akira Nishimatsu, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 10, 1977, Ser. No. 776,294
Claims priority, application Japan, Mar. 30, 1976, 51-34715
Int. Cl.[2] F02M *39/00*
U.S. Cl. 123—139 AW **3 Claims**



1. In a fuel control system for an internal combustion engine of the type wherein the quantity of fuel to be supplied to respective fuel injection nozzles is controlled by a fuel metering device having a single fuel metering orifice whose degree of opening is variable in response to the quantity of intake air and a differential pressure regulating valve for maintaining the differential pressure of fuel across said fuel metering orifice at a predetermined mangitude, said system further comprising a distributor comprising:

(a) a plurality of distribution valves equal in number to the number of cylinders of the engine, each distribution valve comprising:

two chambers partitioned by a diaphragm, an orifice formed through said diaphragm for hydraulically communicating said two chambers, said orifice having a predetermined area of opening, and

a valve seat positioned in opposed relation with said orifice;

(b) a plurality of fuel passages each hydraulically communicating one of said two chambers of each distribution valve and said fuel metering device for supplying the fuel from the latter to the said one chamber,

(c) a plurality of pressure equalizing valves equal in number to the number of cylinders of the engine, each pressure equalizing valve being communicated with the other chamber of each distribution valve for maintaining the pressure of fuel in said other chamber at a predetermined magnitude, each pressure equalizing valve comprising:

a first chamber in communication with said other chamber of each distribution valve,

a second chamber partitioned from said first chamber by a diaphragm, the pressure in said second chamber being maintained at a predetermined magnitude, and

fine pressure adjusting means for finely adjusting the pressure of fuel in said second chamber,

(d) a plurality of fuel passages each hydraulically communicating each pressure equalizing valve and each fuel injection nozzle, whereby the fuel metered by said fuel metering device may be uniformly distributed among the cylinders of the engine.

4,125,103

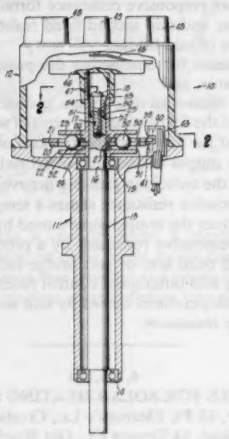
BREAKERLESS IGNITION DISTRIBUTOR FOR INTERNAL COMBUSTION ENGINES

Charles D. Jackson, 349 W. Garfield, Glendale, Calif. 91204

Filed Jan. 7, 1977, Ser. No. 757,758
Int. Cl.[2] F02P *5/00*; H01H *19/60*; F16D *5/00*
U.S. Cl. 123—146.5 A **9 Claims**

1. A breakerless ignition distributor having a shaft adapted to be driven by an internal combustion engine, centrifugally

actuated spark advance and retarding means mounted thereon including first, second, third and fourth discs, means including clamping means for clamping said first second and fourth discs against rotary movement relative to said shaft and leaving said third disc free for limited arcuate movement relative to the remainder of said discs and about the axis of said shaft, said second and third discs having sets of slots inclined in opposite



directions generally radially thereof and holding captive therein a centrifugally responsive ball operable to rotate said third disc relative to the other of said discs in opposition to spring means interconnecting said third disc and said other discs, and said third disc having a notched periphery rotating in proximity to stationary ignition control sensor means mounted close to the path of said notches.

4,125,104

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

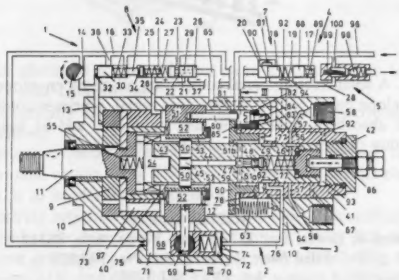
Günter Stein, Weihengaier Str. 1, 8882 Lauingen Donau, Germany

Filed Aug. 26, 1977, Ser. No. 828,126

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1976, 2638736

Int. Cl.[2] F02D *1/04*

U.S. Cl. 123—179 L **22 Claims**



1. In a fuel injection pump for an internal combustion engine, said pump including a fuel distributor member driven cyclically at a rate synchronous with engine speed and including an annular slide surrounding said distributor member having spatial features such as edges and grooves which cooperate with radial bores in said fuel distributor, and including a hydraulic regulator for axially displacing said annular slide which thereby regulates the amount of fuel delivered to said engine and further including a fuel supply pump for supplying fuel to said hydraulic regulator, the improvement comprising:

at least one arbitrarily settable throttle located in the conduit between said fuel supply pump and said hydraulic regulator mechanism for providing an rpm-dependent pressure gradient; and

a spring-loaded pressure control valve connected downstream of said throttle for causing the pressure downstream of said throttle to increase with increasing fuel flow;

whereby the pressures prevailing upstream and downstream of said throttle influence the amount of axial displacement of said annular slide.

4,125,105

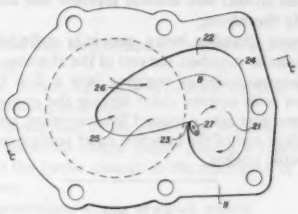
FOUR CYCLE INTERNAL COMBUSTION ENGINE

Michael G. May, Bel Air, CH 1180 Rolle, Switzerland

Continuation-in-part of Ser. No. 630,624, Nov. 10, 1975, Pat. No. 4,094,272. This application Feb. 11, 1977, Ser. No. 767,870

Int. Cl.[2] F02B *23/00*

U.S. Cl. 123—191 L **14 Claims**



1. A four-cycle externally ignited internal combustion engine of the L-head type comprising:

a cylinder block, defining at least one cylinder and including an inlet valve and an outlet valve for each cylinder;

a cylinder head attached to said cylinder block;

a piston moving reciprocatingly within said at least one cylinder thereby defining a combustion chamber of varying geometry;

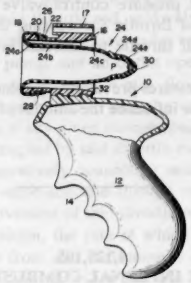
a swirl chamber in said cylinder head extending said combustion chamber into said cylinder head, said swirl chamber having a depth of penetration into said cylinder head which is less than the lateral extent of said swirl chamber and said swirl chamber having a curved wall, the plane projection of which approximately defines a spiral,

a guide channel, defined by cooperation of said piston and said cylinder head when in proximity, said guide channel having two curved side walls originating in the vicinity of the central axis of said cylinder, the distance between said curved walls increasing in the direction of said swirl chamber, thereby defining a widening guide channel, whose maximum width is at least 2/3 of the diameter of said swirl chamber, one of said side walls merging with said wall of said swirl chamber smoothly and without discontinuity and the other of said side walls of said guide channel merging with said wall of said swirl chamber so as to define at least one beak-like projection extending into said guide channel; whereby, during compression, gases flowing through said guide channel enter said swirl chamber tangentially and are distrupted by said beak-like projection to form a substantially single vortex flow pattern in said swirl chamber, the axis of rotation of said vortex being substantially parallel to said cylinder axis.

4,125,106
ELASTIC POWERED CATAPULT

Ward L. Kelly, 4851 Coastal Ave., Bodega Bay, Calif. 94923

Filed Nov. 29, 1976, Ser. No. 745,844
Int. Cl.[2] F41B 7/00
U.S. Cl. 124—17 8 Claims

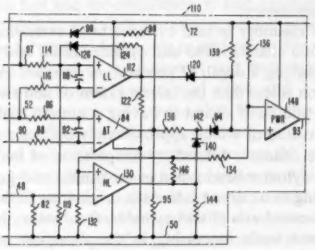


1. A hand operated catapult comprising:
a hand grip;
a rigid annular member carried on said hand grip; and
a projectile propulsion power chamber of elastic material secured around said annular member and extending rearwardly therefrom;
said power chamber being generally cylindrical adjacent said annular member, the end of the chamber remote from the annular member merging into a first frusto-conical section with convex outer surface the convex outer surface merging into a second frusto-conical section and the rear most end of the concave outer surface merging into a projectile pocket.

4,125,107
UNIVERSAL DIFFERENTIAL THERMOSTAT FOR SOLAR HEATING SYSTEM

Richard K. Nurnberg, Norristown, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Continuation-in-part of Ser. No. 679,286, Apr. 22, 1976. This application Nov. 11, 1976, Ser. No. 741,093
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 9 Claims

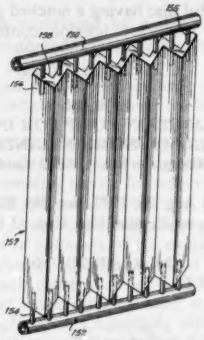


1. A controller for a solar heating system which includes a solar collector, a storage tank and pump means for circulating fluid between the solar collector and the storage tank; the controller comprising:
a first temperature responsive resistance for sensing a temperature in the collector,
a second temperature responsive resistance for sensing a temperature in the storage tank,
said first fixed resistance connected to the other end of the first temperature responsive resistance in a first series circuit therewith,
a second fixed resistance connected to the other end of the second temperature responsive resistance in a second series circuit therewith,
said first and second series circuits forming a resistance bridge and adapted to be connected across a voltage source, said first temperature responsive resistance forming a first arm of said bridge, said first fixed resistance being included in a second arm of said bridge, said second temperature responsive resistance forming a third arm of said bridge; and said second fixed resistance forming the fourth arm of said bridge,
switching means for connecting the pump means across a power source, and
comparator means having inputs connected between the junction of the first and second arms of said bridge and the junction of the third and fourth arms of said bridge, and having an output connected to the switching means for operating the switching means whenever the first temperature responsive resistance senses a temperature which is different from the temperature sensed by the second temperature responsive resistance by a predetermined differential, said third arm of said bridge including means for linearizing said differential control function throughout a range of temperatures sensed by said second temperature responsive resistance.

4,125,108
PANELS FOR SOLAR HEATING SYSTEM

Clifford Porter, 13 Pt. Eleanora's La., Crestwood, N.Y. 10707, and Paul Bakun, 14 Terrace Ct., Old Westbury, N.Y. 11568

Continuation-in-part of Ser. No. 597,541, Jul. 21, 1975, Pat. No. 4,037,583. This application Jun. 13, 1977, Ser. No. 805,656
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 20 Claims



1. A solar heating panel comprising a hollow envelope, said envelope being of heat conductive metal, a primer coating of heat absorbent material on said envelope, and at least one coating of clear plastic on said primer coating.

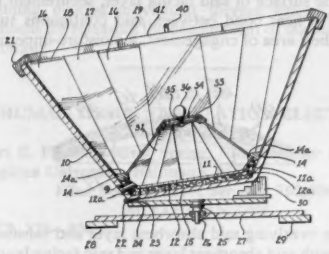
4,125,109
SOLAR OVEN

Samuel F. Erwin, Box 1737, Camp Verde, Ariz. 86322

Filed Nov. 18, 1976, Ser. No. 742,859
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 10 Claims

1. A solar oven comprising means defining an oven chamber for receiving food to be cooked comprising: a base having *n* sides and a solar radiation absorbing surface; a removable solar radiation-pervious pyramidal cover having *n* sides adapted to closely register with said *n* sides of said base, said sides joined together at their edges by silicone adhesives and at their apex by a top plate and inner draw plate and draw screw, and a handle, whereby food to be cooked may be inserted and re-

moved without changing the attitude of the oven relative the sun, means for preventing movement of said cover relative said base while the oven is in use means for orienting said base



member comprising a support plate; a turntable rotatably mounted on said support plate; hinge means coupled between said turntable and said base member and means for concentrating and directing incident solar radiation into said chamber.

4,125,110

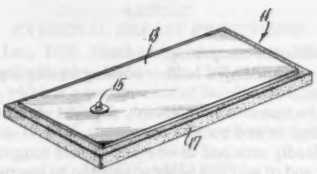
MONITORING AND STIMULATION ELECTRODE

Alan C. Hymes, 3828 Wilmatt Hill Rd., Hopkins, Minn. 55343

Continuation of Ser. No. 785,225, Apr. 6, 1977, abandoned, which is a continuation of Ser. No. 635,008, Nov. 25, 1975, abandoned. This application Nov. 7, 1977, Ser. No. 849,405

Int. Cl.[2] A61B *5/04*

U.S. Cl. 128—2.06 E **21 Claims**



1. An electrode for establishing electrical connection to a patient's skin, comprising:

an electrically conductive backing and current distribution member;

electrical terminal means attached to said member, said terminal means being adapted for connection of the electrode to an electrical wire; and

a substrate attached to said backing and current distribution member for interfacing with the patient's skin, said substrate comprising a homogeneous material including between 21% and 65% high molecular weight hydrophilic polysaccharide material, at least about 0.006% electrolytic salt, at least about 0.6% water and an alcohol, said substrate being sufficiently pliant to permit conformation of the shape of the electrode to the body contours, said substrate being sufficiently firm to prevent penetration of the body contours through the substrate thereby preventing contact of the backing member with the skin, and said substrate being uniformly conductive thereby providing a homogeneous conducting surface to the skin.

4,125,111

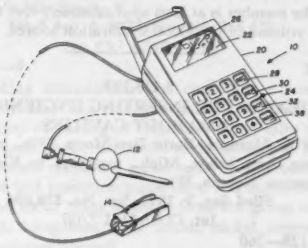
HEARTBEAT DATA ACQUISITION CONVERSION AND DISPLAY SYSTEM

Emmett L. Hudspeth; Philip C. Richardson; John L. Neathery, Jr.; Jerald P. Dykstra; Allen D. Boger, Jr.; William B. Sims, Jr.; Glenn E. Hunt, and Tony M. Quisenberry, all of Austin, Tex., assignors to United States Surgical Corporation, Stamford, Conn.

Division of Ser. No. 627,654, Oct. 31, 1975, which is a division of Ser. No. 385,699, Aug. 6, 1973, Pat. No. 3,940,742. This application Jul. 12, 1976, Ser. No. 704,655

Int. Cl.[2] A61B *5/02, 5/08*

U.S. Cl. 128—2.05 T **3 Claims**



1. A heartbeat data acquisition, conversion and display system comprising:

a pulse rate sensor having a resistance varying cyclically with heartbeat pulse rate;

first means connected to the pulse rate sensor to generate a series of electrical output pulses having a repetition rate related to the cyclic change in the resistance of the pulse rate sensor;

means for generating a train of clock pulses,

a counter receiving the clock pulses, and triggered into an "on" state by a first specified number of output pulses of said first means and triggered into an "off" state by a second specified number of subsequent output pulses of said first means and where a total count registered represents the time period of the second specified number of output pulses representing the cyclic changes in the resistance of the pulse rate sensor;

a divider receiving the total count of the counter wherein the numerator of the divider is a scaling constant and the denominator of the divider is the total count of the counter and where the output of the divider represents the average pulse rate in heartbeat pulses per minute; and

display means connected to said divider for displaying the pulse rate.

4,125,112

TRANSMISSION MEMBERS FOR ELECTRO-VIBRATORY MASSAGE APPLIANCES

Edith Weihs, 23 Siedlungsstrasse, D-7911 Burlafingen, Fed. Rep. of Germany

Filed Nov. 12, 1976, Ser. No. 741,336

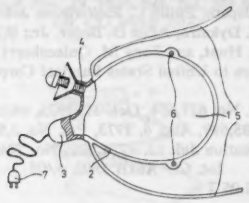
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1975, 2551107

Int. Cl.[2] A61H *1/00*

U.S. Cl. 128—32 **11 Claims**

1. An accessory or transmission part for electrovibratory massage appliances, consisting of a fluid-filled member having

a closable filling and drain aperture and rigidly or detachably connected to a source of vibration, and wherein the volume of



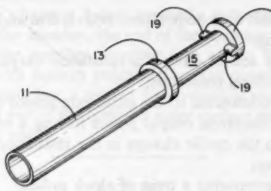
fluid in the member is at least approximately five times greater than the volume of the electric vibration source.

4,125,113

APPLICATOR FOR INSERTING HYGIENIC MEDIA INTO BODY CAVITIES

Raymond A. Morman, Butte Des Morts, Wis., and David V. Duchane, Ann Arbor, Mich., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jan. 9, 1975, Ser. No. 539,694
Int. Cl.[2] A61M *7/00*
U.S. Cl. 128—260 **7 Claims**



1. In an applicator for introducing hygienic media into the vaginal cavity wherein said applicator comprises the combination of an elongated outer tube and a plunger slidably disposed in the rear portion of said tube and in telescopic association therewith, wherein a rear end portion of said tube and a trailing end portion of said plunger each has an annular flange disposed thereabout and wherein when said plunger is slid forward into said tube and said flanges are juxtaposed, the rearward facing surface of the tube flange and the frontward facing surface of the plunger flange comprise confronting faces, and in which said plunger flange alone serves to limit the depth to which the plunger can be slid into the outer tube, the improvement wherein there is provided on only a minor portion of the confronting surface area of one of said faces at least one small discrete projecting element comprising a stop means, the outwardly disposed free end of said element providing the only contact with the other of said faces when said plunger and said tube are fully telescoped together thereby preventing entrapment of body tissue or hair between the remaining portion of the confronting surface area of said faces during use.

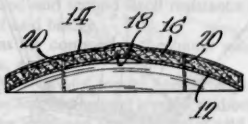
4,125,114

DISPOSABLE NURSING PAD

Virginia L. Repke, Oak Forest, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation of Ser. No. 653,982, Jan. 30, 1976, abandoned. This application May 31, 1977, Ser. No. 801,827
Int. Cl.[2] A61M *1/00*
U.S. Cl. 128—280 **5 Claims**

1. A disposable nursing pad in the form of a dished body, having a smooth and continuous inner concave surface adapted to substantially conform to the contour of a human breast and an outer convex surface adapted to be received within a brassiere which comprises a moisture-permeable hydrophobic, spun-bonded, non-woven, thermoplastic, fibrous facing layer defining said inner concave surface, said facing layer having a fabric weight of about 0.2 to about 2.5 oz./yd.^{2}, an absorbent layer substantially coextensive with said facing layer and having one surface thereof in contiguous engagement with one surface of said facing layer, securement means consisting of a heat bond between said contiguous surfaces throughout their area of engagement, a moisture-impermeable



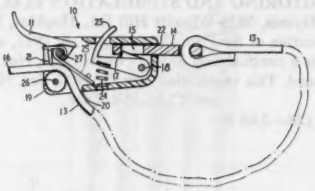
backing layer overlying said absorbent layer and substantially coextensive with said absorbent layer and said facing layer, and further securement means for binding said facing, said absorbent layer, and said backing layer to form a unitary pad, said further securement means being in the form of substantially parallel lines of stitching joining said layers together, whereby said nursing pad is resistant to disintegration when wet.

4,125,115

TOURNIQUET

John D. Mayo, Vaucluse, and Laurence N. Kalnin, Bexley, both of Australia, assignors to Cecil E. Mayo Pty. Ltd., New South Wales, Australia

Filed Oct. 29, 1976, Ser. No. 737,037
Int. Cl.[2] A61B *17/12*
U.S. Cl. 128—327 **2 Claims**



1. A tourniquet comprising:

a buckle comprising a hollow housing having a plurality of openings therein;

a tongue adapted to be receivably engaged within one of said openings in said buckle; and

a belt fixedly attached at one end of said tongue, with the other end of said belt being adapted to be inserted through another of said openings in said buckle;

said buckle having resiliently biased means therewithin for releasably engaging the portion of said belt passing therethrough, said belt engaging means within said buckle comprising a roller and an opposing spring biased releasable jamming edge, said other end of said belt is adapted to pass around a portion of the circumference of said roller to be pinched between said roller and said jamming edge such that said belt may be passed freely around said roller in one direction so as to reduce the length of the tourniquet portion of said belt and is prevented from movement in the reverse direction without release of the jamming edge, which is attached to a pivotally mounted lever which is urged by resilient biasing means to engage said jamming edge with said belt, said lever projecting outwardly of said housing;

whereby the effective length of the tourniquet formed by said belt is readily adjusted;

said tongue having an opening in the part thereof receivable in said buckle;

said buckle also having means therewithin for releasably engaging said tongue, including a lever, a catch on said

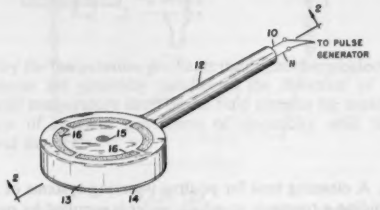
lever for engaging said opening in said tongue, means for resiliently biasing said lever to move in a given direction for urging said catch to engage said opening of said tongue when said tongue is inserted therein, and a portion of said lever being exposed to the outside of said buckle for enabling manual movement thereof against said biasing means for releasing the engagement of said catch with said tongue.

4,125,116

HUMAN TISSUE STIMULATION ELECTRODE STRUCTURE

Robert E. Fischell, Silver Spring, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Feb. 14, 1977, Ser. No. 768,606
Int. Cl.[2] A61N *1/04*
U.S. Cl. 128—404 **6 Claims**



1. Apparatus for applying electrical stimulation current to body tissue comprising, in combination,

a stimulation source having a first relatively positive polarity potential and a second relatively negative polarity potential,

an electrode structure having a first electrode means formed of pyrolytic carbon and a second metallic electrode means, and

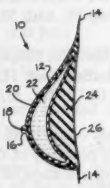
lead means for connecting electrically said first electrode means to the relatively negative polarity potential of said stimulation source and said second electrode means to the relatively positive polarity potential of said stimulation source.

4,125,117

EXTERNAL BREAST PROSTHESIS

Denis C. Lee, 1120 Heatherway, Ann Arbor, Mich. 48104

Continuation-in-part of Ser. No. 769,115, Feb. 16, 1977, abandoned, which is a continuation of Ser. No. 664,234, Mar. 5, 1976, abandoned, which is a continuation-in-part of Ser. No. 605,031, Aug. 15, 1975, abandoned. This application Sep. 26, 1977, Ser. No. 836,533
Int. Cl.[2] A41C *3/10*
U.S. Cl. 128—481 **24 Claims**



1. An external breast prosthesis primarily for mastectomy patients comprising a thin flexible shell of an elastomeric material contoured to conform to the configuration of the breast of the patient and having a peripheral edge extending around the entire periphery of said shell for attachment by an adhesive to the chest wall of the patient and a filler retained within the confines of said thin shell having soft flexible physical characteristics, said shell having a rear portion that is concave within the confines of said peripheral edge so that the prosthesis can be attached at said peripheral edge to the chest wall of a patient to provide within the peripheral edge a chamber of air over the surgical area of the surgical area of the mastectomy, said peripheral edge including an inferior flap, a lateral flap, a superior flap and a medial flap, said inferior, lateral and superior flaps extending in directions away from said concave rear portion and said medial flap extending inward toward said concave rear portion.

4,125,118

SMOKING COMPOSITIONS

Bernard Rudner, Ridgewood, N.J., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Jan. 4, 1977, Ser. No. 756,670
Int. Cl.[2] A24B *15/00*
U.S. Cl. 131—9 **19 Claims**

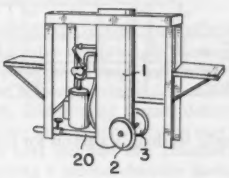
1. A smoking composition that comprises a combustible material and at least one transition metal compound selected from the group consisting of transition metal salts of monofunctional organic monocarboxylic acids having 4 to 24 carbon atoms, overbased transition metal salts of said acids, amine complexes of said transition metal salts, and mixtures thereof, said transition metal being selected from the group consisting of chromium, manganese, iron, cobalt, nickel, copper, zirconium, and mixtures thereof.

4,125,119

HIGH PRESSURE CLEANING DEVICE

Elwood L. Haas, Rte. #3, Bainbridge, Ga. 31717

Filed Mar. 25, 1977, Ser. No. 781,218
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—100 **2 Claims**



1. A high pressure cleaning device, comprising

an open topped vessel having wheels rotatably affixed thereto whereby said vessel is mobile, said vessel having a bottom and sides;

a waste receptacle in the vessel at the bottom thereof for collecting waste cleaned from an item in the vessel;

a plurality of spaced bores formed through the side of the vessel;

an electric motor mounted on the side of the vessel and having electrical conductors connected thereto and extending therefrom for connection to a source of electrical energy;

a water pressure pipe having spaced opposite first and second ends, said water pressure pipe extending into the vessel via one of the bores therethrough in a manner whereby its first end is inside said vessel near the top thereof, the second end of the water pressure pipe being spaced from the vessel;

a water supply pipe connected to the water pressure pipe and extending into the vessel via another of the bores therethrough;

a suction pipe in the vessel coupled to and extending from the water supply pipe into proximity with the waste receptacle in the vessel via the other of the bores through said vessel;

a drain pipe having spaced opposite first and second ends, said drain pipe extending into the vessel via still another of the bores therethrough in a manner whereby its first end is inside the vessel at the bottom thereof, the second end of the drain pipe being spaced from the vessel for draining water from the vessel;

a nozzle on the first end of the water pressure pipe in the vessel;

a pump mounted on the motor and coupled to and driven by the motor; and

a plurality of valve means in the water pressure and suction pipes for selectively applying the pump to said pipes whereby in one valve operation said pump supplies water under pressure via the water supply and water pressure pipes to the nozzle and the output of the nozzle cleans the surface of an item onto which it is directed in the vessel and material removed from the item is collected in the waste receptacle, and in another valve operation said pump draws water and water mixtures from the vessel out through the suction pipe, the water pressure pipe, the high pressure hose and another nozzle.

4,125,120

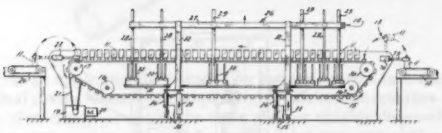
WASHING APPARATUS FOR CONTAINERS

Wendell E. Standley, Lake Forest, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 660,587, Feb. 23, 1976, abandoned. This application May 26, 1977, Ser. No. 800,779

Int. Cl.[2] B08B *3/02, 9/08*

U.S. Cl. 134—126 **10 Claims**



1. An automatic washing apparatus for containers comprising:

conveyor means,

means to move said conveyor means in a given path of travel,

releasable holding means operatively associated with said conveyor means for engagement with said containers to secure said containers in said holding means,

a plurality of nozzle means disposed in a linear manner and in the same direction as said path of travel as said conveyor, with a plurality of nozzle means providing the same function, said nozzle means including a nozzle head defining at least one lateral orifice composed of an annular aperture extending in a substantially completely open manner to effect a 360° spray pattern, said nozzle means constructed and arranged for insertion into and out of said containers,

washing and fluid conduit means connected to said nozzle means,

means constructed and arranged to move said nozzle means into and out of said containers, and

means operatively associated with said releasable holding means to release said containers from said releasable holding means,

so that when said nozzle heads are moved into and out of said container said annular spray pattern will incrementally move twice over the entire side walls of said containers and said containers will be washed with separate nozzle heads performing the same function.

4,125,121

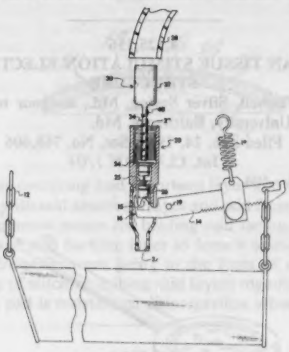
CLEANING TOOL FOR POULTRY WATERING SYSTEMS

Mial R. Tidy, Jr., Rte. 3, Box 271, Siler City, N.C. 27344

Filed Aug. 15, 1977, Ser. No. 824,359

Int. Cl.[2] B08B *3/02, 9/02*

U.S. Cl. 134—167 C **2 Claims**



1. A cleaning tool for poultry watering systems of the type including a reservoir to which water is supplied by means of a valve in a metering housing, which selectively meters water from a supply line into said reservoir, and wherein said metering housing includes an upper port into which the water is delivered, which periodically becomes clogged, said cleaning tool comprising:

(a) an elongated tubular member having a first end and a second end;

(b) said first end having means associated therewith for quickly attaching said tool to said supply line at such times as when said supply line is disconnected from said valve body;

(c) said first end having an effective inner diameter substantially equal to the inner diameter of said supply line;

(d) said second end having a substantially reduced outer and inner diameter, said outer diameter being reduced to such an extent that said second end may be inserted within the opening in said metering housing through which said water passes and easily moved around therein, and said inner diameter being reduced to such an extent that the water pressure from said supply is increased substantially to enable flushing debris and deposits therein backwardly out of said metering housing.

4,125,122

DIRECT ENERGY CONVERSION DEVICE

John Z. O. Stachurski, 200 W. 15th St., Apt. 14E, New York, N.Y. 10011

Continuation-in-part of Ser. No. 350,407, Aug. 12, 1975, Pat. No. 3,899,359. This application Aug. 11, 1975, Ser. No. 603,299

Int. Cl.[2] H01L *35/30*

U.S. Cl. 136—205 **11 Claims**

1. A method for directly converting heat to electricity in an electric generator using a plurality of thermoelectric elements and heat pipes comprising the steps of

heating a first fluid stream at a heat source and directing said first fluid stream toward a heat sink;

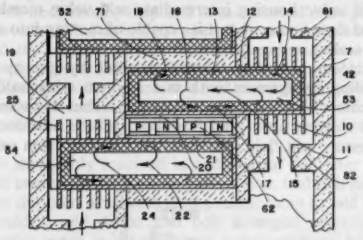
directing a cool second fluid stream toward said heat source;

locating a plurality of thermal bridges effectively thermally insulated from each other operatively between the first and second fluid streams to effectively place the first and the second fluid streams in counterflow relationship for the direct conversion of heat to electricity by said thermal bridges;

heat exchanging one end of the plurality of thermal bridges

with the first fluid stream at successively lower temperatures thereof; and

heat exchanging respectively the other ends of the thermal bridges with the second fluid stream at respectively successively lower temperatures thereof;



whereby the temperature gradients inside the thermoelectric elements are generally parallel to the direction of the overall temperature drop of the fluid streams for maximization of efficient generation of electricity with high power density.

4,125,123

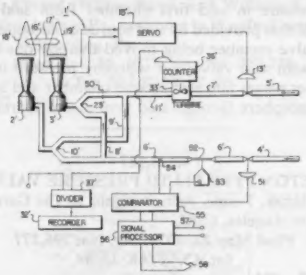
METHODS OF AND MEANS FOR ACCURATELY MEASURING THE CALORIFIC VALUE OF COMBUSTIBLE GASES

William H. Clingman, Jr., Dallas, Tex., assignor to Precision Machine Products, Inc., Dallas, Tex.

Division of Ser. No. 682,578, May 3, 1976, Pat. No. 4,062,236. This application Aug. 12, 1977, Ser. No. 824,031

Int. Cl.[2] G01N *25/30*

U.S. Cl. 137—80 **1 Claim**



1. Apparatus for regulating the flow of gas through a line comprising:

a capillary section in said line;

a control valve in said line upstream of said capillary section;

a first pressure sensor located at a selected point in said capillary section;

a second pressure sensor located in said line-downstream from said capillary section;

the dimensions of said capillary section and the location of said first pressure sensor being such that gas flow through at least that portion of the capillary section lying between the first pressure sensor and the downstream end of the section is laminar;

a signal processor;

means for inputting a constant signal of selected value to said processor;

a thermocouple exposed to ambient temperature;

said thermocouple being connected to said processor for delivering a signal thereto which is substantially proportional to the absolute ambient temperature;

said processor including means for multiplying said constant signal by the square root of said thermocouple signal to yield a product signal;

a comparator;

said pressure sensors being connected to said comparator for delivering pressure magnitude signals thereto and said processor being connected to said comparator for delivering said product signal thereto;

said comparator including means for taking the difference between said pressure magnitude signals, comparing said difference with said product signal, and sending a signal to said control valve to operate it in a direction to equalize said difference and said product signal.

4,125,124

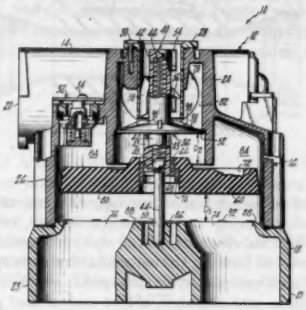
SEQUENCING VALVE

Carl L. C. Kah, 778 Lakeside Dr., N. Palm Beach, Fla. 33408

Filed Aug. 2, 1976, Ser. No. 710,792

Int. Cl.[2] F16K *21/00*

U.S. Cl. 137—119 **31 Claims**



31. A sequencing valve comprising a housing, said housing including an inlet port and an outlet section having a plurality of outlet ports, said housing having a first chamber connected to said outlet ports, said housing further defining an internal flow passage whereby fluid communication may be established between said inlet port and said first chamber, said internal flow passage including a second chamber having an opening entering into said first chamber, a valving member located in said first chamber having at least one port therethrough, said valving member being movable between a seated and unseated position, in the seated position a valving member port registers with one of said housing outlet ports while the remainder of the valving member blocks flow through the remaining outlet ports, in the unseated position the valving member is spaced from said outlet ports, piston means located in said housing for cooperation with said opening in said second chamber, said piston means being movable between a position where it coacts with said opening in said second chamber to prevent flow therethrough to a position in said first chamber allowing flow from said opening of said second chamber into said first chamber, stem means connecting said piston means to said valving member, biasing means for biasing said piston means into a position coacting with said opening in said second chamber to prevent flow therethrough until sufficient pressure has been generated to overcome said biasing means and for biasing said valving member into its unseated position, said second chamber having a circular sealing surface for said piston means to sealably bear against when fully biased by said biasing means to prevent reverse flow around said piston means back into said inlet port, said piston means being movable to its position in said first chamber allowing flow in response to sufficient pressure generated at said inlet port, said movement of said piston means permitting said valving member to move to its seated position, cam means operatively connected to said housing and said stem means to cause said valving member to be rotatably

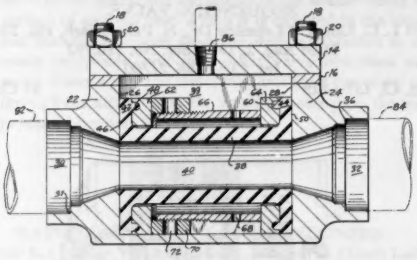
indexed in response to movement of said piston means by proper pressure variations and said biasing means so that the valving member port can be sequentially aligned with each of said outlet ports.

4,125,125

PINCH VALVE CONSTRUCTION

Levi I. Ezekoye, 1106 Wood St., Pittsburgh, Pa. 15243, and Spiros G. Raftis, Pittsburgh, Pa., assignors to Levi I. Ezekoye, Pittsburgh, Pa., a part interest

Filed May 3, 1976, Ser. No. 682,512
Int. Cl.[2] F16K *43/00*
U.S. Cl. 137—315 **7 Claims**



1. An improved pinch valve construction comprising a unitary hollow pinch valve housing, one end of said pinch valve housing having a pipe receptacle, said valve housing having an internal chamber spaced away from said one end of said pinch valve housing so that said chamber is spaced away from said pipe receptacle, flexible pinch valve sleeve means located within said chamber, a first end of said pinch valve sleeve means being spaced from said pipe receptacle and affixed to the inner wall of said pinch valve housing, said housing having an opening so that a passage for fluid flow is provided from said pipe receptacle through said opening and into said pinch valve sleeve means, internal means within said housing for urging the opposed first and second end portions of said pinch valve sleeve means against respective inner wall portions of said valve housing, said urging means including means for respectively forcing said first end portion of said pinch valve sleeve means against said valve housing adjacent and about the periphery of said opening, and for forcing said second end portion of said pinch valve sleeve means against said valve housing, said forcing means including a first thrust washer and a second thrust washer, said pinch valve sleeve means first end portion being a first flange, said first thrust washer abutting against said first flange, said pinch valve sleeve means second end portion being a second flange, said second thrust washer abutting against said second flange, a threaded valve sleeve jacket circumscribing said pinch valve sleeve means, a nut in engagement with said threaded valve sleeve jacket and adapted to abut against one of said thrust washers, and internal means for constricting said pinch valve sleeve means.

4,125,126

PRESSURE AND VACUUM RELIEF VALVE

Roy F. Davis, Jr., P.O Box 634, Norwood, Minn. 55368

Filed Mar. 28, 1977, Ser. No. 781,578
Int. Cl.[2] F16K *17/18*
U.S. Cl. 137—493.1 **4 Claims**

1. A high pressure and vacuum relief valve, comprising:

a valve housing having one end adapted for attachment to a fluid flow line and including a removable cover on the opposite end,

a valve seat within said valve housing serving to divide said valve housing into a first chamber in communication with said flow line and a second chamber provided with vent means to the atmosphere,

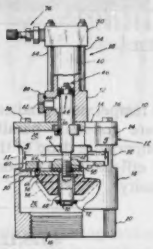
a valve member disposed within said valve housing and adapted for sealing engagement with said valve seat,

said valve member being provided with an air vent affording communication between said first and second chambers,

a closure member,

means for slidably supporting said closure member within said valve housing intermediate said valve member and said flow line so that it is capable of moving into and out of sealing engagement with said air vent,

said closure member adapted to move by gravity out of sealing engagement with said air vent when said valve member is seated and said flow line is shut down and upon the starting up of said flow line and the introduction of pressure and fluid into said first chamber from said flow line, air trapped in said first chamber is provided an avenue of escape through said air vent in said seated valve to said second chamber and to the atmosphere during the time said closure member is moved to its sealing engagement with said valve member by pressure or fluid,



a source of air under pressure,

means for operably connecting said source of air under pressure to said valve member to normally hold said valve member in sealing engagement with said valve seat, and

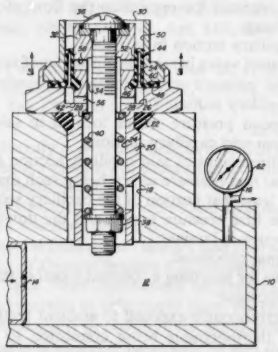
when pressure in said first chamber from said flow line exceeds that provided by said source of air under pressure, said valve member being moved thereby out of engagement with said valve seat whereby pressure in said first chamber passes into said second chamber and is vented to the atmosphere through said vent means therein.

4,125,127

PISTON TYPE FLUID PRESSURE VALVE

James B. Harter, Tempe, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed May 12, 1977, Ser. No. 796,277
Int. Cl.[2] F16K *17/04*
U.S. Cl. 137—494 **5 Claims**



1. A fluid pressure control valve comprising:

a housing having a high pressure fluid duct, a low pressure exhaust port, and a passage interconnecting said duct and port;

a sleeve secured to said housing in said passage, said sleeve having a central passage and first and second internal shoulders respectively facing said pressure duct and exhaust port;

a piston head loosely disposed in said central passage of the sleeve to define an annular space between said piston head and the internal surface of the sleeve, said piston head having a lower face contactable with said second shoulder to limit inward movement of said piston head toward said pressure duct, said head having a central opening and cross ducts at said lower face and at an intermediate location;

a bolt threadably received in and closing the outer end of said central opening of the piston head, said bolt having a stop disposed in spaced, facing relationship to said second shoulder, said piston and bolt arranged whereby said annular space is in continuous communication with said pressure duct through said cross ducts at said lower face;

a helical coil compression spring extending between said stop and said first shoulder for urging said piston head inwardly toward said pressure duct; and

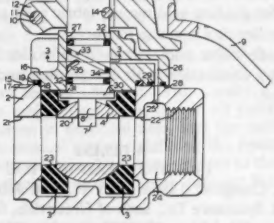
a convoluted diaphragm disposed in said annular space with inner and outer circular ends respectively secured to said piston head and said sleeve to seal said annular space from said exhaust port, said convoluted configuration of the diaphragm defining inner and outer parallel walls respectively in contact with the outer surface of said piston head and said internal surface of the sleeve, a portion of said inner wall overlying said intermediately located cross ducts for controlling fluid communication between said pressure duct and said exhaust port through said intermediately located cross ducts as said piston head moves relative to said diaphragm.

4,125,128

VENTED BALL-TYPE CUT-OUT COCK

Michael P. Elward, Wilkes-Barre, and William K. Mong, N. Huntingdon, both of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Nov. 10, 1977, Ser. No. 850,128
Int. Cl.[2] F16K *11/06*
U.S. Cl. 137—596 **5 Claims**



1. A cock comprising:

(a) a hollow housing having a pair of fluid flow passageways opening thereinto to which may be connected respectively an inlet conduit and an outlet conduit and, wherein the improvement comprises, a vent passageway open at one end into that one of said fluid flow passageways to which said outlet conduit may be connected and at the other end to the exterior of said housing,

(b) a pair of ball seat seals disposed in said hollow housing in opposite spaced-apart relationship and each having a through bore that at one end is in alignment with one end of one of said pair of fluid flow passageways in said housing, the opposite end being provided with a spherical seat,

(c) a ball valve element having a passageway extending therethrough and so positioned between said ball seat seals in sealing relationship with said spherical seat on each respective ball seat seal as to, in an open position of said valve element, establish a communication between said inlet conduit and said outlet conduit,

(d) a cover member for said hollow housing and having therein a bore, a vent port and a passageway that at one end opens at the wall surface of said bore and at the other end in such a location as to be in alignment with said other end of said vent passageway in said hollow housing,

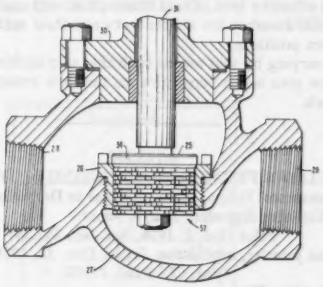
(e) a valve stem rotatably mounted in said bore in said cover member and separably connected to said ball valve element for effecting rotation of said valve element between said open position and a closed position in which said communication is closed, said valve stem having provided thereon a spiral groove that extends around one fourth of its circumference and is so obliquely disposed that, upon rotating said valve element to its said closed position by said valve stem, one end of said spiral groove is in alignment with said one end of said passageway in said cover member and the other end is in alignment with said vent port in said cover member whereby a venting communication is established between said outlet conduit and atmosphere.

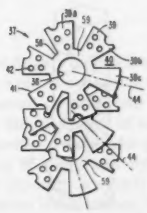
4,125,129

FIXED AND VARIABLE RESISTANCE FLUID THROTTLING APPARATUS

Hans D. Baumann, Woonsocket, R.I., assignor to Masoneilan International, Inc., Norwood, Mass.

Continuation-in-part of Ser. No. 565,158, Apr. 4, 1975, Pat. No. 3,971,411, which is a division of Ser. No. 444,020, Mar. 7, 1974, Pat. No. 3,908,698. This application Jul. 26, 1976, Ser. No. 708,337
Int. Cl.[2] F16K *47/04, 47/08*
U.S. Cl. 137—625.3 **13 Claims**





1. In a fluid throttling apparatus

a number of horizonal, flat, annular stamped metal discs, said discs fixedly concentrically face-engaged in a vertical

stack having inner and outer peripheries, one of which peripheries comprises a cylindrical wall,

a cylindrical member having a cylindrical wall for mating engagement with said cylindrical stack wall,

at least some ones of said discs provided with horizontal flow area openings,

at least some others of said discs constructed and arranged in said stack to provide vertical flow restriction orifices,

all said flow area openings of said discs being open to said cylindrical stack wall and closed to the other stack periphery,

said flow area openings of said ones of said discs having radial and circumferential extent to encompass the area of said flow restriction orifices provided by said others of said discs,

said ones and others of said discs so sequenced and so relatively rotated in said stack as to define therewithin and around its said wall generally vertical fluid throttling channels comprised each of alternating series of vertically juxtaposed flow area openings and flow restriction orifices,

said discs further constructed and arranged to reversingly horizontally offset the vertically successive orifices of said channels whereby said channels define toruous passageways in which the fluid is made to travel horizontally in said openings and to turn right angularly into and out of said orifices,

means for relatively vertically shifting said stack and cylindrical member between full closed and full open positions of greater and lesser overlapping of said stack wall by said mating cylindrical member wall,

means for closing off vertical flow through the end of said stack that is overlapped by said cylindrical member only in the full closed position of said stack and cylindrical member,

whereby in the between full closed and full open positions of said stack and cylindrical member the flow into and out of said tortuous passageways is only radial at said one, vertical-flow-closed end of, and only vertical at the other, cylindrical-member-overlapped end of, said stack, and

means for varying at least one of the (a) active number and (b) effective area of said channels as said stack and cylindrical member are shifted between their said closed and open positions,

said varying by said means such that said shifting varies the flow area and inversely varies the flow resistance of said stack.

4,125,130

BELLOWS PERMITTING TWISTING MOVEMENT

Ken Yamamoto, Tokyo, Japan, assignor to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Dec. 2, 1976, Ser. No. 747,247

Claims priority, application Japan, Dec. 11, 1975, 50-14779

Int. Cl.² F16L *11/00*

U.S. Cl. 138—121 **2 Claims**

1. A bellows comprising a plurality of coaxially joined bellows elements each made up of a plurality of *n* parallelogram-shaped wall elements of thin plate material joined together and positioned around a common center axis, the upper and lower edges of the thus joined wall elements defining spaced parallel congruent planar orthopolygonal shapes each having sides, $n \geq 3$, each of the orthopolygonal shapes being angularly offset in a direction around the central axis from the next adjacent orthopolygonal shapes, said wall elements each having a fold line between the diagonally opposite vertexes which are farthest apart.

4,125,131

FIXED DRIVING CONNECTION BETWEEN A GUIDE ROLLER AND DELIVERY ROLLER OF A LOOM

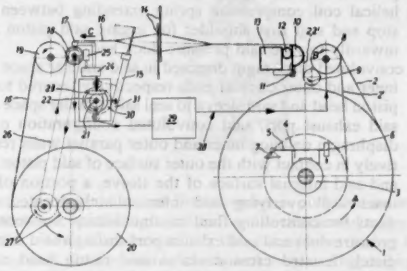
Allan W. H. Porter, Lustmuhle, Switzerland, assignor to Adolph Saurer, Arbon, Switzerland

Filed Sep. 8, 1977, Ser. No. 831,607

Claims priority, application Switzerland, Sep. 21, 1977, 11947/77

Int. Cl.² D03D *49/06, 42/20, 49/04*

U.S. Cl. 139—99 **7 Claims**



1. A loom including a drive device for weaving fabric from warp yarns extending from a source over a backrest provided adjacent one end of said loom and after being woven into fabric being fed over a breast beam positioned adjacent the other end of said loom, said improvement comprising:

at least one driven guide roller disposed in front of said back rest relative to the direction of flow of said warp yarn;

means for guiding said warp yarns over said driven guide roller in a non-slip manner;

at least one driven delivery roller disposed after the breast beam relative to the direction of flow of said warp yarn;

means for guiding said woven fabric over said driven delivery roller in a non-slip manner;

said guide roller and said delivery roller being in a fixed driving connection with one another and with said drive device.

4,125,132

FRICTION PAD DEVICE

Ralph M. Compton, 4 Briarcreek Pl., and Johnny W. Jenkins, Jr., 111 Sycamore Dr., both of Greenville, S.C. 29607

Filed Mar. 17, 1977, Ser. No. 778,439

Int. Cl.² D03D *45/20*

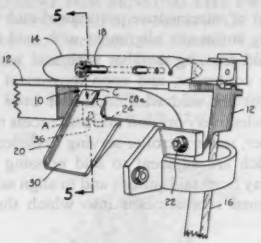
U.S. Cl. 139—255 **9 Claims**

1. For use with automatic yarn filling apparatus on a shuttle loom wherein a shuttle carrying a yarn filled bobbin is picked to and fro across a lay, said bobbin being ejected from said shuttle when spent and being directed by a bobbin deflector plate to a stripper chute of said automatic filling apparatus wherein the unused yarn is unwound therefrom prior to re-filling said spent bobbin with yarn, a device for imparting a rotation to a spent bobbin when ejected from said shuttle so as to cause a tail of the unused yarn to unwind from said spent bobbin comprising:

a friction pad,

means for mounting said friction pad in substantially flush

relationship with said bobbin deflector plate and lying in a path of said bobbin as it descends from said shuttle, and



said friction pad including a generally planar surface layer of friction material for abutting a head of said ejected bobbin causing it to rotate.

4,125,133

AIR JET LOOM WITH IMPROVED AIR GUIDING COMB

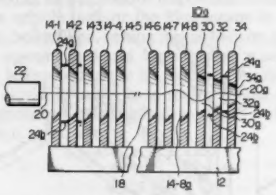
Yasushi Kobayashi, Kokubunji, and Akira Ito, Hanno, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Sep. 2, 1977, Ser. No. 830,344

Claims priority, application Japan, Sep. 3, 1976, 51-104981

Int. Cl.[2] D03D *47/29*

U.S. Cl. 139—435 **11 Claims**



1. An air guide comb for an air jet loom having an air jet nozzle through which a pressurized air is passed out with a weft yarn, and a row of aligned air guiding tooth members arranged in a manner that openings formed in the respective tooth members from an air passage through which said weft yarn is passed by the aid of said pressurized air, each of said openings being bounded by a frusto-conical surface of the corresponding tooth member with an apex of said surface pointing in the direction of weft yarn picking, which is characterized in that said row of aligned air guiding tooth members has at least first and second adjacent tooth members having respective openings which form a part of said air passage and are stepwisely different in sectional area, and the inclination angles of the frusto-conical surfaces defining the openings of said first and second tooth members, with respect to the longitudinal center line of said air passage being different from each other.

4,125,134

WEAVING MECHANISM OF A WAVE-TYPE SHEDDING LOOM

Jury I. Komarov, ulitsa Miklukho-Maklaya, 29, korpus 1, kv. 215; Alexei N. Parshin, Nagornaya ulitsa, 34, korpus 43, kv. 53, and Dmitry V. Titov, 13 Parkovaya ulitsa, 27, korpus 2, kv. 49, all of Moscow, U.S.S.R.

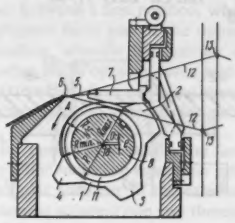
Filed Dec. 8, 1977, Ser. No. 858,855

Claims priority, application U.S.S.R., Dec. 23, 1976, 2433205

Int. Cl.[2] D03D *47/26*

U.S. Cl. 139—436 **4 Claims**

1. A weaving mechanism for a wave-type shedding loom, comprising: a driven shaft; discs with teeth, mounted on said shaft in succession in an angularly staggered fashion so that their teeth and valleys define respective helical surfaces of the same pitch, said discs with the teeth being adapted to beat up a weft thread to the fell of the cloth being woven; a portion of the helical surface defined by the valleys of said discs, having a varying radius diminishing along the axis of rotation of said



shaft in the direction of the advance of the helical surfaces; support rollers underlying said discs; helical lugs provided on the surface of said support rollers and defining a helical surface engaging the helical surface defined by the valleys of the discs and having the same pitch therewith.

4,125,135

DEVICE FOR EXERTING BACK-PULL ON THE HEDDLES OF JACQUARD LOOMS

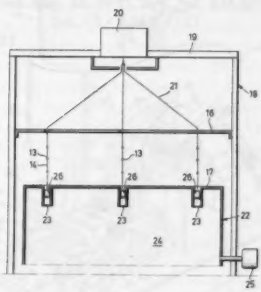
Wolfgang Ebisch, In den Eichen, 5249 Breitscheidt-Heide, Fed. Rep. of Germany

Filed Jul. 12, 1977, Ser. No. 814,935

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1976, 2631175

Int. Cl.[2] D03C *13/00, 3/22, 3/44*

U.S. Cl. 139—456 **12 Claims**



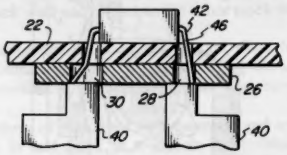
1. A back-pull device for use on heddles of Jacquard looms, said device comprising a piston connected to a first end of each heddle, means at a second opposite end of each heddle for selectively controlling the movement of each heddle between at least two different positions, a cylinder guide receiving each piston in sealed sliding relation, said cylinder guides being carried by a wall of a chamber in which a pressure different from atmospheric pressure is maintained, said cylinder guides opening into said chamber, opposite ends of said piston being subjected to atmospheric pressure and said pressure in said chamber to normally draw said pistons towards said chamber and away from both of said two different positions, and each heddle extends from its respective piston.

4,125,136

CUT AND CLINCH MECHANISM

Luis A. Olcese, Hawthorne, and Joseph E. Roesch, Cerritos, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 18, 1977, Ser. No. 816,620
Int. Cl.[2] B21F *11/00*
U.S. Cl. 140—105 **6 Claims**



1. In a device for bending and cutting leads projecting through an article,

an apertured shear plate adapted to receive the leads to be bent and cut;

shear blocks mounted on one side of the shear plate in sliding relation thereto;

means for biasing said shear blocks to a rest position, and

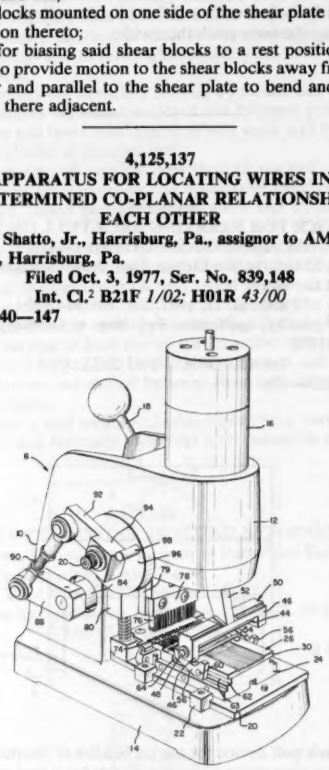
means to provide motion to the shear blocks away from each other and parallel to the shear plate to bend and cut the leads there adjacent.

4,125,137

APPARATUS FOR LOCATING WIRES IN PREDETERMINED CO-PLANAR RELATIONSHIP TO EACH OTHER

Walter C. Shatto, Jr., Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 3, 1977, Ser. No. 839,148
Int. Cl.[2] B21F *1/02*; H01R *43/00*
U.S. Cl. 140—147 **9 Claims**



1. Apparatus for deploying and locating a plurality of wires in side-by-side relationship comprising:

a templet having a wire supporting surface extending thereacross, a plurality of wire-receiving recess means extending across said surface in one direction,

a wire pressing member extending across said surface transversely of said one direction, said wire pressing member being movable across said surface in said one direction,

a wire controller disposed beside, and in advance of, said pressing member, said controller being movable across said surface in unison with said pressing member, said controller providing a wire deflecting surface which extends upwardly relative to said wire supporting surface whereby,

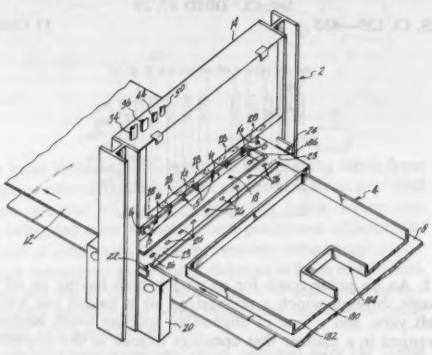
upon placement of intermediate portions of said wires on said wire supporting surface in alignment with said recess means and beneath said pressing member with said wires extending over said wire controller, and upon movement of said wire pressing member and said wire controller over said surface, said wires are selectively pressed into said recess means by said pressing member, said controller serving to deflect portions of said wires which are adjacent to said pressing member upwardly and away from said surface and to align said wires with the predetermined recess means into which they are to be pressed.

4,125,138

GENERATION OF POLYURETHANE FOAM

Gerald V. Dever, Jr., Trumbull, and Louis R. Chiocchio, East Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 762,555, Jan. 25, 1977. This application Jun. 13, 1977, Ser. No. 806,045
Int. Cl.[2] B65B *43/42*
U.S. Cl. 141—141 **11 Claims**



1. An apparatus for generating foam from a mixture of foam-forming materials in a structure having a preformed configuration, said apparatus comprising:

conveyor means for conveying such a structure along a horizontal path;

a plurality of foam gun heads mounted in spaced relationship to each other over and transversely to said horizontal path, each foam gun head including a foam dispensing outlet and valve means operatively associated with said outlet for controlling the discharge of the foam-forming materials therefrom;

first sensing means upstream of said foam dispensing outlets for sensing the passage of such a structure thereby;

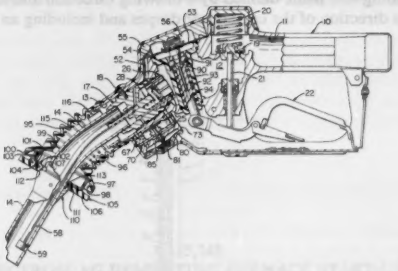
a plurality of second sensing means positioned upstream of said foam dispensing outlets in spaced relationship to each other in a direction transverse to said horizontal path, each one of said second sensing means being associated with one foam gun head for sensing in a vertical direction the presence of such a structure; and means for opening said valve means of each foam gun head in response to the first sensing means sensing such a structue and its associated second sensing means sensing such a structure, and for closing the valve means of a given foam gun head in response to its associated second sensing means detecting the absence of structure.

4,125,139

AUTOMATIC SHUT-OFF NOZZLE HAVING AN ARRANGEMENT FOR SENSING THE PRESENCE OF LIQUID IN VAPOR RETURN MEANS OF THE NOZZLE

Robert W. Guertin, Cincinnati, and Chester W. Wood, Milford, both of Ohio, assignors to Dover Corporation, New York, N.Y.

Filed Jun. 3, 1977, Ser. No. 803,048
Int. Cl.[2] B65B *57/14*
U.S. Cl. 141—206 14 Claims



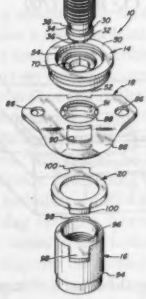
1. An automatic shut-off nozzle comprising a body having an inlet and an outlet, a valve in said body controlling flow of liquid from said inlet to said outlet, means controlling the operation of said valve, spout means communicating with said outlet and having its free end for disposition in an opening of a fill pipe of a vehicle tank or the like, means to return vapor from the tank being filled, sealing means to form a seal between the fill pipe opening and said vapor return means when said spout means is disposed in the fill pipe, and means to sense the presence of liquid in said vapor return means to cause said controlling means to be activated to move said valve to its closed position.

4,125,140

ACCESS PANEL FASTENER

Peter A. Basile, Edison, N.J., assignor to Amerace Corporation, New York, N.Y.

Continuation of Ser. No. 635,699, Nov. 26, 1975, abandoned.
This application Jan. 19, 1978, Ser. No. 870,801
Int. Cl.[2] F16B *43/00*
U.S. Cl. 151—69 27 Claims



1. In an access panel fastener for securing an outer panel to an inner structure:

a ring-like retainer including opposite faces; and

a threaded fastener element having an axially extending external surface for reception within a generally complementary portion of the retainer;

said retainer and fastener element external surface having means for capturing the fastener element within the complementary portion of the retainer while permitting selective axial displacement of the fastener element relative to the retainer between a first position, wherein the fastener element projects from one of the opposite faces, and a second position, wherein the fastener element projects from the other of the opposite faces, said capturing means and said external surface including means for positively releasably retaining the fastener element at said first position;

said means for positively retaining the fastener element at said first position including an annular groove establishing a radial annular shoulder in the external surface of the fastener element adjacent one end thereof;

a plurality of similar discrete retaining members carried by the retainer, each said member having a radially outer surface and a radially inner portion terminating in a concave inner surface generally complementary to the bottom of the groove, said retaining members being adapted for radial movement between outer positions in which said retaining members are not in said groove and inner positions in which the radially inner portion of each said retaining member is in said groove in juxtaposition with said shoulder; and

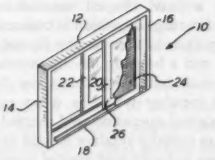
resilient means in said retainer, said resilient means comprising a cochlear spring surrounding the discrete retaining members and in engagement with said radially outer surfaces of the retaining members for biasing each of the discrete retaining members radially inwardly, independent of one another, into said groove, and into juxtaposition with said shoulder, the overlapping coils of said spring being in intimate contact with each other at all operative positions.

4,125,141

SELF DRAINING FRAME STRUCTURE

Nicholas Stillwell, White City, Oreg., assignor to Stillwell Manufacturing Corp., Middlesex, N.J.

Filed Aug. 15, 1977, Ser. No. 824,657
Int. Cl.[2] E06B *3/32*
U.S. Cl. 160—91 4 Claims



1. A self draining closure structure comprising:

a frame having a top brace, opposed side braces and a base structure;

fixed closure element rigidly secured within said frame;

a slidable closure element mounted within said frame and supported by said base structure, said slidable element being slidable between a closed position adjacent one of said side braces and an opened position adjacent the other of said side braces;

a slidable screen element mounted within said frame and supported by said base structure, said slidable screen element being wider than the distance between said opposed side braces;

said base structure including an inner sill member, a pedestal and an outer sill member, said inner sill member including a bore formed therein, said pedestal including a channel

formed therein, said bore and said channel being in communication and defining a fluid flow path;

a throughbore formed in said fixed closure element, said throughbore in said fixed closure element cooperating with said channel and said bore to define a fluid flow path for draining fluid tending to collect in said inner sill; and wherein

said slidable screen element defines a barrier between the exterior of said closure and said fluid flow path.

4,125,142

SAFETY DEVICE PROTECTING ROLLER BLINDS AGAINST UNROLLING

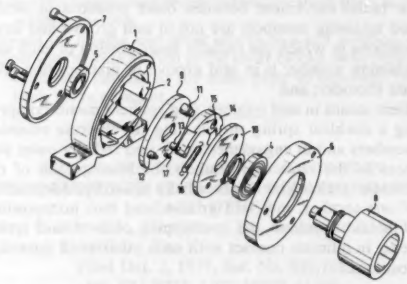
Artur Föhl, Haubersbronn, Germany, assignor to Repa Feinstanzwerk GmbH, Alfdorf, Germany

Continuation of Ser. No. 692,274, Jun. 3, 1976, abandoned. This application Sep. 9, 1977, Ser. No. 831,801

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1975, 2524422

Int. Cl.[2] E06B *9/208*

U.S. Cl. 160—291 **5 Claims**



1. In a roller blind with a horizontally oriented winding shaft, a safety device for arresting unrolling of the blind in the event of failure of support means for the blind, which comprises a shaft butt coupled to one end of the winding shaft to prevent rotation of the shaft butt relative to the winding shaft, at least one drive disk disposed on said shaft butt which drive disk rotates with said shaft butt, a bearing pin parallel to the axis of the shaft butt extending from the peripheral region of said drive disk, a pawl shaped inertial member pivotally mounted on said bearing pin which is concentric to the center of gravity and perpendicular to the lateral surfaces of said inertial member, and a housing having internal teeth in which is disposed the shaft butt with the drive disk and pivotally mounted inertial member whereby when said roller blind is rolled down in normal operation said inertial member will not change its position radially relative to said drive disk, but with increased unrolling velocity said inertial member in the form of a pawl will change its position radially relative to said drive disk and engage the internal teeth of said housing to arrest unrolling of the blind.

4,125,143

CURTAIN OR DRAPERY HANGING ARRANGEMENT

Hermann Pape, Thunacker, Germany; Peter Schroeder, Oberwil, Switzerland, and Rudolf Schmitz, Kastanienbaum, Fed. Rep. of Germany, assignors to Gardisette Holding AG, Switzerland

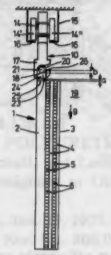
Filed Nov. 12, 1975, Ser. No. 631,197

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1974, 2453460; Aug. 2, 1975, 2534573; Sep. 26, 1975, 2542943

Int. Cl.[2] A47H *13/14*

U.S. Cl. 160—348 **44 Claims**

1. A hanging arrangement for curtains or drapes, the arrangement comprising: a holding means attachable to an upper edge of the curtain or drapes for holding and fixing pleats therein, a hanger means provided with at least one surface portion engaging a curtain or drape rail means for displaceably mounting said holding means at said rail means, means for detachably connecting said holding means to said hanger means including at least one connecting pin means provided at one of the two elements consisting of said hanger means and said holding means, and recess means provided in the other of said two elements for receiving said at least one pin means, said holding means and said hanger means each being resistant to a bending in a plane defined by a drawing direction and suspension direction of the curtains or drapes and including an upper



and a lower end, said lower end of said hanger means defining a first abutment surface, said upper end of said holding means defining a second abutment surface, said first and second abutment surfaces being spaced from each other by a predetermined distance in a normal suspension of the curtain or drape, said recess means including a guiding surface means for guiding said at least one pin means into and out of said recess means, said guiding surface means being disposed at a predetermined distance above a bottom of said recess means, said predetermined distance between said abutment surfaces being less than the predetermined distance between said guiding surface means and the bottom of said recess means.

4,125,144

REFRACTORY MATERIAL FOR LABELING, WHICH CONTAINS AN ACTIVATABLE ELEMENT

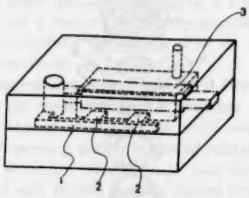
Junichi Kawamoto, Aichi; Yasuo Ito; Akio Ito, both of Nagoya; Tamotsu Nakamua, Aichi; Motoyuki Nakamura, Nagoya; Yoshiaki Yamaoto, Nagoya, and Koji Yonekura, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation-in-part of Ser. No. 521,132, Nov. 5, 1974, abandoned. This application May 3, 1976, Ser. No. 682,459

Claims priority, application Japan, Nov. 8, 1973, 48-12583

Int. Cl.[2] B22C *1/00*

U.S. Cl. 164—4 **11 Claims**



1. A method of locating the source of impurities in a casting comprising the following steps:

producing each of a plurality of constituent parts of a casting mold from a refractory material containing a different activatable element, each of said mold parts including a surface adapted to contact molten metal during pouring;

pouring molten metal into said casting mold, said molten

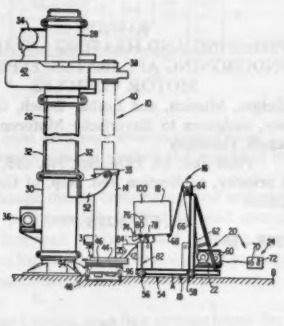
metal absorbing impurities in the form of non-metallic inclusions originating from said surface of said mold parts;
disassembling the casting mold after the solidification of said molten metal;
activating activatable elements within said impurities in said casting after said disassembly;
identifying the individual activated elements in said impurities; and
comparing the identified elements with the materials of said mold parts to locate the source of said impurities.

4,125,145

ELECTROSLAG REMELTING FURNACE START-UP APPARATUS

Boris I. Medovar; Yury V. Latash; Alexsey G. Bogachenko, all of Kiev; Gary P. Kaganovsky, Zaporozhie; Semen A. Leibenzon, Zaporozhie; Konstantin S. Eltsov, Zaporozhie; Georgy K. Gabuev, Zaporozhie, and Zinoviy I. Poticha, Zaporozhie, all of U.S.S.R., assignors to Institut Elektrosvarki Im. I.O. Patona, Gorkogo, Kiev, U.S.S.R.

Continuation of Ser. No. 72,327, Sep. 15, 1970, abandoned. This application Sep. 3, 1974, Ser. No. 502,865
Int. Cl.[2] B22D *27/02;* **H05B** *7/18;* **C22B** *4/00*
U.S. Cl. 164—252 **39 Claims**



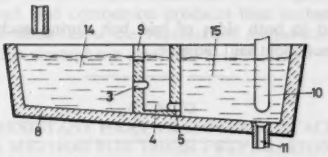
1. An electroslag remelting furnace start-up system wherein said furnace includes a mold, at least one electrode extending into the mold and a source of electrical power connected to the electrode, said start-up system comprising: a bottom pouring device having inlet means and outlet means, said outlet means being in fluid communication with the lower portion of the furnace mold for the introduction of molten slag thereinto; and slag transfer means, adapted to be positioned adjacent said bottom pouring device comprising slag crucible means and operating means, including control means, connected to and operable on said slag crucible means to transfer molten slag from said crucible means to said bottom pouring inlet means to introduce molten slag into the furnace mold, whereupon introduced molten slag rising in said mold engages the electrode and enables completion of the electrical power circuit of said furnace; said control means comprising means responsive to a condition indicative of said completion of the electrical power circuit to automatically render said operating means operable to discontinue transfer of molten slag from said slag crucible means to said bottom pouring device inlet means.

4,125,146

CONTINUOUS CASTING PROCESSES AND APPARATUS

Ernst Müller, Hochgerichtstrasse 26, Wattenheim, and Adolf Trautwein, Donaustrasse 53, Gottmadingen, both of Germany

Continuation of Ser. No. 665,718, Mar. 10, 1976, abandoned, which is a continuation of Ser. No. 494,161, Aug. 2, 1974, abandoned. This application Nov. 24, 1976, Ser. No. 744,945
Claims priority, application Switzerland, Aug. 7, 1973, 11395/73
Int. Cl.[2] B22D *11/10*
U.S. Cl. 164—437 **1 Claim**



1. In a continuous-casting installation which comprises a ladle, a tundish and a mould in which molten metal flows from the ladle to the tundish and then to the mould, the improvement for continuously removing lightweight contaminants from the continuously flowing molten metal comprising:
a dam extending completely across said tundish in the middle thereof subdividing said tundish into a first basin and a second basin;
a ladle outlet positioned over said first basin adjacent the side thereof spaced from said dam for delivering molten metal to said first basin;
a confined chamber located along the molten metal flow path in said dam;
said chamber having inlet means associated therewith for introducing molten metal into said chamber from said first basin and for creating a rotating vortex flow of the molten metal only in said chamber about a vertical axis, and outlet means associated with said chamber for continuously discharging molten metal from said chamber into said second basin;
said outlet means being located below said inlet means;
said chamber further having contaminant discharge means, separate from said outlet means, for continuously discharging contaminants in the molten metal from said chamber into said first basin, which contaminants rise to the top of said chamber via the action of the rotating vortex flow;
said contaminant discharge means being located above said inlet means adjacent the top of said chamber; and
a tundish outlet, for conducting molten metal to said mould, located in the bottom of said second basin adjacent the side of said second basin spaced from said dam.

4,125,147

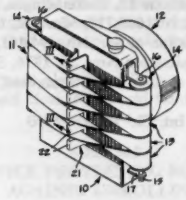
METHOD FOR CONTINUOUSLY MAINTAINING A RADIATOR FREE OF DEBRIS

John M. Bailey, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 701,335, Jun. 30, 1976, Pat. No. 4,057,105. This application Jun. 13, 1977, Ser. No. 806,392
Int. Cl.[2] F28G *13/00*
U.S. Cl. 165—1 **4 Claims**

1. The method for continuously maintaining a radiator free of debris and the like during operation thereof comprising the steps of
rotating a plurality of horizontally disposed and vertically spaced endless and perforated belts about said radiator and on spaced-apart, parallel and vertically disposed axes, and
simultaneously twisting each belt one-half a turn during each

rotation of said belt to form a "mobius strip" therewith whereby each front and back side of said radiator is ex-



posed to both sides of said belt during each rotation thereof about said radiator.

4,125,148

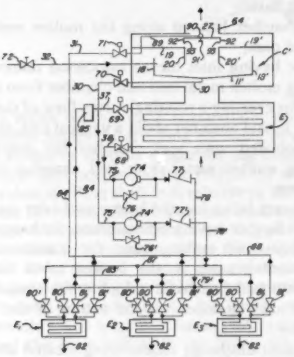
METHOD FOR UTILIZATION OF WASTE ENERGY

Victor D. Molitor, Denver, Colo., assignor to Stainless Equipment Company, Englewood, Colo.

Continuation-in-part of Ser. No. 647,205, Jan. 7, 1976, abandoned. This application Apr. 22, 1977, Ser. No. 789,938

Int. Cl.[2] F23J *11/00;* **F24C** *15/20;* **F25B** *29/00;* **F28F** *27/02*

U.S. Cl. 165—2 **12 Claims**



1. A method of recovering waste energy from an exhaust gaseous source thereof, including heat, which includes:

causing movement of exhaust gas from said source through a heat exchanger to supply heat thereto;

moving a heat transfer liquid through said heat exchanger for heating said heat transfer liquid;

supplying water to a chiller having walls and baffle means for directing gas into engagement with a water bath for agitating the same and producing evaporation of water for cooling said water and said gas;

causing movement of said exhaust gas through said chiller and into engagement with said water bath;

passing makeup air for a room and the like through heat exchange means which includes a path for a heated or chilled liquid to heat or cool, alternatively, said makeup air;

circulating said heated heat transfer liquid through said heat exchange means; and

alternatively circulating said chilled water from said chiller through said heat exchange means.

4,125,149

HEAT EXCHANGE ELEMENTS

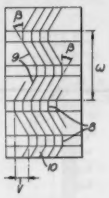
Gerhard Kritzler, Freudenberg; Siegfried H. Schluter, and Paul Eckert, both of Wenden, all of Fed. Rep. of Germany, assignors to Apparatebau Rothemuhle Brandt & Kritzler, Fed. Rep. of Germany

Filed Apr. 15, 1977, Ser. No. 788,081

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 2616816

Int. Cl.[2] F28D *19/00*

U.S. Cl. 165—10 **8 Claims**



5. A heat exchange pack for a rotary regenerative air preheater designed for heat-exchange-medium flow therethrough in a predetermined direction and comprising alternately elements of a first type and elements of a second type;

said elements of the first type being corrugated in a conformation which in face view is a wave-form including in the wave-form portions parallel to the said direction; and

said elements of the second type having straight corrugations of different cross-sectional amplitude from the said wave-form corrugations of the said elements of the first type, the said straight corrugations extending parallel to the said directions.

4,125,150

VENTILATING AND HEATING APPARATUS OR AIR-CONDITIONING APPARATUS, ESPECIALLY FOR MOTOR VEHICLES

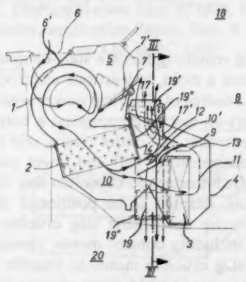
Werner Zelger, Munich, and Lothar Busch, Gilching, both of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Germany

Filed Jun. 14, 1976, Ser. No. 695,765

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1975, 2526537

Int. Cl.[2] F25B *29/00*

U.S. Cl. 165—16 **19 Claims**



1. In a ventilating and heating apparatus, especially for motor vehicles of the type having cold air channel means having a blower means associated therewith, a warm-air channel means, a heat-exchanger means, said heat exchanger means being within said warm air channel means, a cold air by-pass means branching off upstream of the heat-exchanger means, control means for alternately controlling the cold-air by-pass

means and the warm-air channel means, and a housing defining a distributor space provided with ventilating- and heating-connecting outlet openings, said distributor space of said housing being additionally provided with cold-air and warm-air inlet openings communicating with said cold-air and warm-air channel means respectively, the improvement comprising: the cold-air inlet-opening and the ventilating-connecting outlet opening being disposed at least approximately mutually opposite, and the warm-air inlet openings and heating-connecting outlet openings being arranged offset with respect thereto so as to form a temperature stratifying flow means for simultaneously directing said cold air from said cold-air inlet opening through said distributor space to said ventilating-connecting outlet and said warm air from said warm-air inlet openings through said distributor space to heating-connecting outlet openings without the need for intervening flow control means.

4,125,151

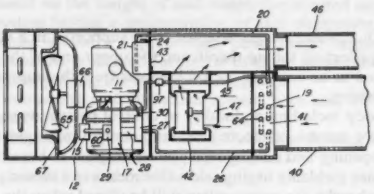
PACKAGE HEAT EXCHANGER SYSTEM FOR HEATING AND COOLING

Herbert G. Hays, Homestead, and Ralph W. Sweitzer, Williamsburg, both of Iowa, assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 533,599, Dec. 17, 1974, abandoned, which is a continuation of Ser. No. 185,631, Oct. 1, 1971, abandoned. This application Jun. 24, 1976, Ser. No. 699,418

Int. Cl.[2] F25B *19/00*

U.S. Cl. 165—58 **14 Claims**



1. A package heat exchange system comprising:

two compartments joined together and separated by a partition;

first heat exchange means comprising first and second heat exchangers positioned in a first of said compartments adjacent a first wall region of said package spaced from said partition for exchanging heat with air passing through said first heat exchange means and an opening in said first wall region;

means positioned within said first compartment for blowing said air through said first heat exchange means and said first wall region opening;

second heat exchange means comprising a condenser for a first fluid comprising a heat pump working fluid positioned in said second compartment adjacent an opening in a second wall region spaced from said partition and said first wall region;

means positioned within said second compartment for blowing air through said condenser and said second wall region aperture to extract heat from said working fluid;

means positioned within said second compartment for compressing said working fluid and for circulating said working fluid between said second heat exchange means and said first heat exchanger of said first heat exchange means;

a heating unit positioned within said second compartment comprising third heat exchange means surrounding a chamber and means for supplying the products of combustion to said chamber for heating a second fluid;

said third heat exchange means comprising a combustion prod products heat exchanger having a surface area contacting said products of combustion which is substantially greater than the surface area of said heat exchanger contacting said second fluid;

means for circulating said second fluid directly between said second heat exchanger of said first heat exchange means and said combustion products heat exchanger for supplying heat to said air circulated through said first heat exchange means by said blower; and

means for maintaining said second fluid as a liquid substantially at atmospheric pressure and for preventing substantial vaporization of said liquid comprising circulating said liquid with said second fluid circulating means while blowing air with said blower through said first heat exchange means which maintains said liquid flowing through said combustion products heat exchanger at a temperature below the vaporization temperature of said liquid at atmospheric pressure.

4,125,152

SCALE RESISTANT HEAT TRANSFER SURFACES AND A METHOD FOR THEIR PREPARATION

Mark O. Kestner, Evanston, and Robert H. Krueger, Palatine, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 19, 1977, Ser. No. 834,600

Int. Cl.[2] B05D *3/06*

U.S. Cl. 165—133 **5 Claims**

1. A method for rendering heat transfer surfaces resistant to the deposition of adherent scale consisting of plasma-polymerizing fluoroethylene monomer in the presence of said surfaces, and depositing on said surfaces a fluoropolymer coating.

4. In a heat exchanger comprising heat transfer fluid conducting means and aqueous heat transfer fluid, the improvement wherein the surfaces of said heat transfer fluid conducting means contacting said aqueous heat transfer fluid are coated to a thickness of less than 1/10,000" with plasma-polymerized fluoroethylene monomer.

4,125,153

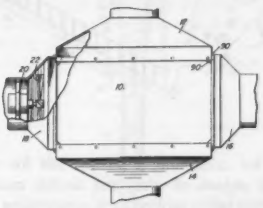
HEAT EXCHANGER

James H. Stoneberg, R.D. #1, Brockport, Pa. 15823

Filed Mar. 25, 1976, Ser. No. 670,570

Int. Cl.[2] F28F *3/08*

U.S. Cl. 165—166 **6 Claims**



1. A cross-flow heat exchanger including a plurality of laterally spaced generally parallel first rectangular baffle plates having first and second pairs of opposite side marginal edges with the first pair of marginal edges of each plate disposed at generally right angles relative to the second pair of corresponding marginal edges of that plate, the first and second pairs of said edges including oppositely directed right angularly disposed side flanges extending therealong and terminating outwardly in oppositely outwardly directed right angularly disposed flange extensions, a generally rectangular divider plate disposed between each pair of adjacent first plates, said divider plate including first and second pairs of opposite side marginal edges, the last mentioned pairs of marginal edges including oppositely sharply reversely bent portions defining narrow opposite side channels extending along pairs of opposite side marginal edges of said plate opening toward each other and disposed on opposite sides of the medial plane of said

plate, the pairs of opposite side channels of said divider plate snugly and slidably receiving the adjacent flange extensions of the adjacent baffle plates therein, thereby defining a parallelopiped having isolated side-by-side alternate generally right angularly disposed passages extending therethrough and whose opposite ends open outwardly through the four sides of said parallelopiped disposed between one pair of opposite sides thereof, and first and second pairs of tubular fittings including one set of corresponding ends of generally rectangular cross section, said one set of ends of said fittings being supported from said four sides.

4,125,154

VESSEL FOR SALT MELTS, PARTICULARLY FOR MODIFYING THE PROPERTIES OF OBJECTS OF GLASS, VITROCRYSTALLINE MATERIAL OR STONEWARE

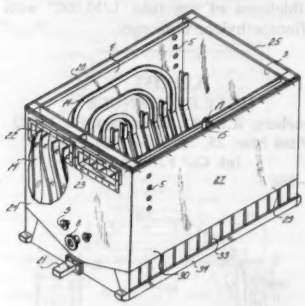
Johannes Franke; Kurt Kessler, both of Jena; Ulrich Kühne, Torgau; Heinz Sauerbier, Camburg; Kurt Schneider, and Karl Unbehaun, both of Jena, all of German Democratic Rep., assignors to VVB Haushalts- und Verpackungsglas, Weisswasser, German Democratic Rep.

Filed Jul. 18, 1975, Ser. No. 597,056

Claims priority, application German Democratic Rep., Jul. 31, 1974, 180215

Int. Cl.[2] F28F *3/12, 9/22;* F26B *3/00*

U.S. Cl. 165—169 **13 Claims**



1. Vessel for containing a molten salt for modifying the properties of objects of glass and similar materials and for maintaining that salt in molten form, comprising an inner vessel and an outer vessel elastic peripheral flange means connecting the inner vessel and the outer vessel and closing an intermediate space between the inner and outer vessels, baffle means in said space for guiding a heating gas, means for admitting a heating gas to said space, said baffle means including T-sectioned fins mounted on the inside of the outer vessel for supporting the inner vessel and reinforcing the combined vessel structure, said vessel including a generally upright wall, an upright web extending transversely from the inner to the outer vessel and separating portions of said space within said wall into separate sections, said baffle means constituting means effective to lead heating gas from one of said separate sections to a remote region of said space and then to the other of said separate sections, said baffle means and said web constituting means directing said heating gas about said space in such a way as substantially uniformly to heat said vessel and control the temperature thereof to within close tolerances.

4,125,155

TUBING HANGER WITH FAIL-SAFE CONTROL PASSAGEWAY

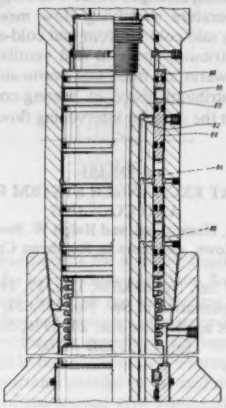
Bill M. Brock, Jr., Stafford, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed Sep. 8, 1977, Ser. No. 831,583

Claims priority, application United Kingdom, Sep. 17, 1976, 38730/76

Int. Cl.[2] E21B *33/03*

U.S. Cl. 166—97 **9 Claims**



1. In a tubing hanger adapted to be supported in a wellhead and supporting tubing therefrom, the upper end of the hanger adapted to be engaged by a Christmas tree, the improvement comprising,

a body including a plurality of control passageways,

valve means connected to said control passageways for opening and closing said passageways,

means yieldably urging said valve means to a closed position whereby the passageways will be closed when the body is installed in a wellhead,

said valve means being exposed to the exterior of said body whereby the valve means may be actuated to the open position by means connected to the Christmas tree.

4,125,156

AQUEOUS SURFACTANT SYSTEMS FOR IN SITU MULTIPHASE MICROEMULSION FORMATION

Gilbert R. Glinsmann, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 6, 1977, Ser. No. 804,132

Int. Cl.[2] E21B *43/22*

U.S. Cl. 166—252 **39 Claims**

1. A process for preparing an optimized aqueous surfactant system comprising:

(a) preparing a series of aqueous surfactant systems at different brine concentrations, the surfactant of said series of surfactant systems having a relatively small hydrophobic portion; mixing each surfactant system separately with a series of pure hydrocarbons from a homologous series and allowing the mixtures to equilibrate;

(b) determining the relative volume of the phases in the resulting equilibrated mixtures in (a) and preparing a phase volume diagram for each hydrocarbon;

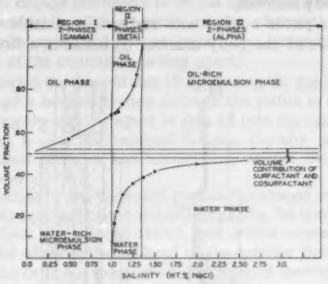
(c) mixing oil from a formation to be produced with at least one surfactant-brine composition of the type used in (a), allowing the resulting mixture to equilibrate and comparing it with the phase volume diagrams of (b); and

(d) using said comparison of (c) in conjunction with the relationship that increasing electrolyte concentration is equivalent to increasing the hydrophobic portion of said surfactant to prepare a new aqueous surfactant system

thus adjusted so as to yield upon contact with said oil of said formation, three phases over a narrow range of salinity.

14. A process for recovering oil from a subterranean oil-bearing reservoir comprising the steps of

(a) injecting into said reservoir through at least one injection well, an aqueous surfactant system comprising water, electrolyte, surfactant and cosurfactant which surfactant system corresponds in surfactant and cosurfactant composition to a system which on contact with oil corresponding to that in said reservoir forms three phases, a predominantly oil phase, an immiscible microemulsion phase, and



a predominantly aqueous phase over a range of electrolyte concentration of less than 1 percentage point by weight based on the weight of said water, the injected surfactant system having a concentration of said electrolyte in said water within a 1 percentage point range beginning at about the point said formation of three phases starts and encompassing the three-phase region;

(b) contacting said surfactant system with said oil in said reservoir;

(c) thereafter injecting a drive fluid thus forcing said oil toward at least one recovery well; and

(d) recovering said oil.

4,125,157

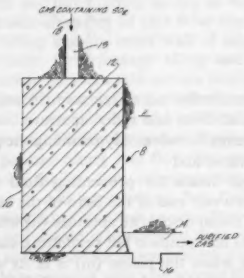
REMOVING SULFUR DIOXIDE FROM GAS STREAMS WITH RETORTED OIL SHALE

Richard D. Ridley, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Continuation of Ser. No. 728,421, Sep. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 656,061, Feb. 6, 1976, abandoned, which is a continuation of Ser. No. 492,894, Jul. 29, 1974, abandoned. This application Jul. 12, 1977, Ser. No. 814,991

Int. Cl.[2] E21B *43/24*; E21C *41/10*

U.S. Cl. 166—259 **12 Claims**



1. A method for removing sulfur dioxide from a gas stream comprising the step of passing the gas through an in situ oil shale retort containing a fragmented permeable mass of retorted oil shale particles containing alkaline earth metal oxides at a sufficient temperature to remove sulfur dioxide from the gas.

4,125,158

OIL RECOVERY PROCESS EMPLOYING A HYDROCARBON SLUG AND A THICKENED AQUEOUS SURFACTANT SLUG

Jerry M. Waite; Ralph F. Burdyn, and Joseph G. Savins, all of Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 689,445, May 24, 1976, Pat. No. 4,042,030. This application Aug. 8, 1977, Ser. No. 822,470

Int. Cl.[2] E21B *43/22*

U.S. Cl. 166—273 **8 Claims**

1. In the recovery of oil from a subterranean oil-containing reservoir penetrated by spaced injection and production system, the method comprising:

(a) injecting into said reservoir via said injection system at least 0.02 pore volume of a hydrocarbon slug having a viscosity lower than the viscosity of the reservoir oil,

(b) thereafter injecting into said reservoir via said injection system a thickened aqueous surfactant slug comprising an aqueous solution of a surfactant system which includes an organic sulfonate surfactant and which functions to increase the viscosity of said aqueous solution to a value at least as great as the viscosity of the reservoir oil while decreasing the interfacial tension between said aqueous solution and said reservoir oil,

(c) thereafter injecting into said reservoir via said injection system an aqueous flooding medium to displace oil to said production system, and

(d) recovering oil from said production system.

4,125,159

METHOD AND APPARATUS FOR ISOLATING AND TREATING SUBSURFACE STRATAS

Roy R. Vann, P.O. Box 38, Artesia, N. Mex. 88210

Filed Oct. 17, 1977, Ser. No. 843,152

Int. Cl.[2] E21B *33/138, 43/27*

U.S. Cl. 166—285 **11 Claims**

1. Method of isolating and treating a hydrocarbon containing formation located downhole in a borehole comprising the steps of:

attaching spaced vessels to a tubing string, filling the vessels with a liquid having a high vapor pressure, thermally insulating the exterior of the vessels to thereby reduce

vaporization of the liquid to a minimum, lowering the vessels into the borehole;

positioning one of the vessels uphole of the formation to be treated and positioning the other of the vessels downhole of the formation to be treated;

removing the insulation from the vessels so that the exterior thereof makes intimate contact with any fluid contained within the wellbore, thereby causing heat in proximity of the vessels to be absorbed by the vaporizing action of the liquid contained therewithin;

continuing to remove heat from above and below the formation to be treated until the well fluid and adjacent strata is frozen to form two spaced plugs, thereby isolating the formation to be treated;

pumping treatment fluid along a flow path which extends down through the tubing string, into the annulus between the two vessels and tubing string, and laterally away from the borehole and into the formation to be treated;

removing the vessels and tubing string from the borehole after the plugs have thawed.

4,125,160

METHOD OF CEMENTING A HIGH TEMPERATURE BOREHOLE

Oliver W. Crinkelmeyer, Kilgore, Tex., and Earl F. Morris, Wagoner, Okla., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 743,191, Nov. 19, 1976, abandoned, which is a division of Ser. No. 546,845, Feb. 3, 1975, abandoned. This application Aug. 12, 1977, Ser. No. 824,021

Int. Cl.[2] E21B *33/13, 33/138*

U.S. Cl. 166—293 **13 Claims**

1. A method of cementing in a borehole penetrating a subterranean formation wherein the temperature of the area to be cemented results in a hydraulic cement slurry being subjected to an elevated temperature of at least about 200° F., wherein a settable hydraulic cement slurry is emplaced in said area to be cemented and said slurry contains a fluid loss agent selected from the class consisting of a polyalkylene polyamine, a polyalkyleneimine or a mixture thereof, the improvement which comprises:

including in addition in said hydraulic cement slurry, as parts by weight per 100 parts of dry hydraulic cement, from about 1 to about 5 parts of a compound selected from the group consisting of a lignosulfonate, a lignoamine or a mixture thereof; and a compound selected from the group consisting of a water soluble carbonate, bicarbonate, or mixture thereof, in an amount from that which is effective to enhance the fluid loss property of said surry up to about 3 parts.

4,125,161

CHEMICAL CUTTING APPARATUS AND METHOD FOR USE IN WELLS

Edmond D. Chammas, Houston, Tex., assignor to Weatherford/DMC, Inc., Houston, Tex.

Filed Sep. 6, 1977, Ser. No. 830,511

Claims priority, application United Kingdom, Apr. 18, 1977, 16064/77

Int. Cl.[2] E21B *29/00*

U.S. Cl. 166—297 **8 Claims**

1. Apparatus for cutting an object within an earth bore, comprising a generally elongate, cylindrical structure that includes,

(a) means for suspending the apparatus within the bore,

(b) firing means for producing ignition temperatures,

(c) means for generating gas by ignition from the firing means (b),

(d) anchor means activated by the gas generating means (c) for maintaining the apparatus substantially stationary in axial relation to the earth bore, during the cutting operation,

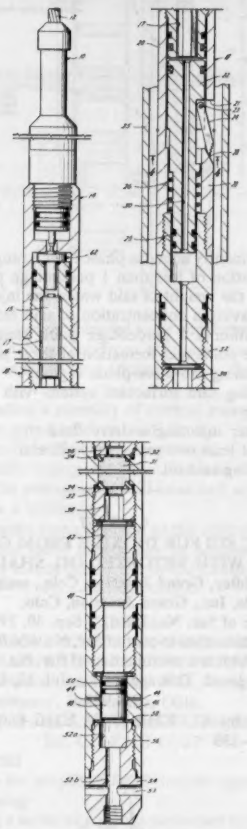
(e) chemical means releasably contained within the apparatus for incendiary cutting of the object within the earth bore upon release of said chemical means, and

(f) discharge means for directing the chemical means (e) toward the object to be cut within the earth bore, including:

(i) a body member forming a segment of the generally elongate cylindrical structure of the apparatus and having a bore therethrough,

(ii) said body member (i) having at least one radial discharge aperture and at least one circulation aperture, each said aperture providing communication between the bore of said body member and the exterior of the body member,

(iii) a piston coaxial with and axially slidable within the bore of the body member (i) between a first position



adjacent the radial aperture (ii) and a second position spaced from said radial aperture,

(iv) means for releasably retaining the piston (iii) in its first position, and

(v) seal means for preventing fluid communication between one end of the bore of the body member (i) and the radial discharge aperture (ii) when the piston (iii) is in its first position but permitting said fluid communication when the piston (iii) is in its second position and permitting circulation of well fluid through the radial discharge aperture (ii) and the circulation aperture (ii) when the piston (iii) is in its first position.

5. A method for cutting an object in an earth bore comprising the steps of:

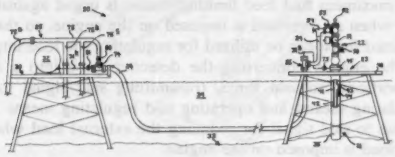
(a) disposing an apparatus forming a housing comprising a firing sub, a gas generator sub, an anchor sub, a chemical cylinder, a catalyst sub and a severing head adjacent to the desired object to be cut,
(b) firing an igniter in the firing sub,
(c) producing a gas pressure by activating the gas generator sub by means of step (b),
(d) displacing a piston along the axis of the anchor sub by the gas pressure generated in step (c),
(e) extending at least one wedge means coacting with and actuated by the piston in step (d) through an aperture in the anchor assembly to extend out from the anchor sub and to engage the object to be cut upon firing in step (b),
(f) disposing a cutting agent in the chemical cylinder whereby upper and lower rupture discs comprise the end walls of the contained cutting agent,
(g) rupturing the discs in step (f) by passing the gas in step (c) through a bore extending through the piston in step (d),
(h) urging the cutting agent in step (f) into the catalyst sub having a catalyst disposed therein, thereby producing increased pressure and temperature within the catalyst sub, and
(i) displacing by the increased pressure produced in steps (c) and (h) a second piston slidably engaging the inner margin of at least one exhaust orifice, said orifice connecting the interior of the severing head to the exterior thereof such that the orifice is substantially unimpeded thereby permitting the ignited cutting agent and catalyst or reactant in step (h) to exhaust therethrough.

4,125,162

WELL FLOW SYSTEM AND METHOD

David L. Groves, Sr., Houma, La.; Olen R. Long, Celina, Tex., and Billy G. McCoy, Houma, La., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed May 13, 1977, Ser. No. 796,619
Int. Cl.[2] E21B *19/00, 43/00*
U.S. Cl. 166—314 **9 Claims**



1. A system for two-way flow communication between a well service facility and a remote well including flow means communicating with separate flow passages in said well comprising: a flow line between said service facility and said well; an inner tubing in said flow line extending between said service facility and said well, said inner tubing having an outside diameter less than the inside diameter of said flow line, the outer wall of said inner tubing and the inner wall of said flow line defining a first annular flow passage along said flow line around said inner tubing between said service facility and said well head and said inner tubing defining a second separate flow passage between said service facility and said well head; first flow means at said service facility for communicating with said first annular flow passage along said flow line; second flow means at said service facility for communicating with said second flow passage in said inner tubing; first flow means at said well for communicating said first annular flow passage in said flow line with one of said separate well flow pasages; and second flow means at said well for communicating the other of said separate well flow passages with said second flow passage in said inner tubing.

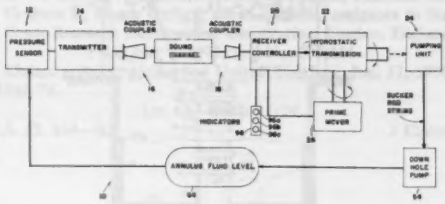
7. A method of gas lift production of a well comprising the steps of: flowing lift gas to said well through a tubing string extending from a supply of lift gas under pressure to said well; and flowing production fluids from said well through a flow line disposed around said tubing string for said lift gas in an annular flow passage in said flow line defined by the inner wall of said flow line and the outer wall of said lift gas tubing.

4,125,163

METHOD AND SYSTEM FOR CONTROLLING WELL BORE FLUID LEVEL RELATIVE TO A DOWN HOLE PUMP

Doug Fitzpatrick, Tulsa, Okla., assignor to Basic Sciences, Inc., Tulsa, Okla.

Filed Dec. 2, 1977, Ser. No. 857,009
Int. Cl.[2] E21B *43/00; F04B 49/02, 49/08*
U.S. Cl. 166—314 **13 Claims**



1. A system for controlling well bore fluid level relative to a down hole pump comprising:
(a) means for generating fluid pressure data disposed down hole in communication with fluids surrounding the pump;
(b) a down hole transmitter for transmitting the fluid pressure data to the well surface;
(c) means for comparing said fluid pressure data with a preselected range of values proportional to the desired well bore fluid level relative to the down hole pump and;
(d) means for controlling well pumping speed disposed at the well surface and operably connected to the means for comparing fluid pressure data with said preselected range of values,
whereby when the fluid pressure is too high, pumping speed is increased and when the fluid pressure is too low, the speed is decreased.

8. A method for controlling well bore fluid level relative to a down hole pump comprising the steps of:
(a) measuring fluid pressure at or near the pump;
(b) comparing the measured fluid pressure with a preselected range of values proportional to the desired fluid level;
(c) transmitting the comparison data to the well surface, and;
(d) varying the pump speed in accordance with the comparison data;
whereby when the pressure level is above the desired level, pumping speed is increased and when the pressure level is below the desired level pumping speed is decreased.

4,125,164

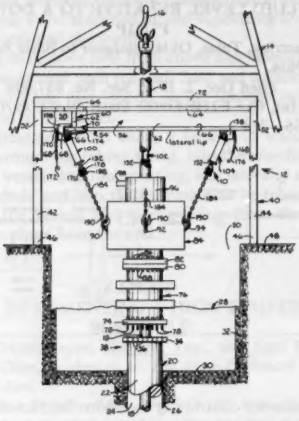
APPARATUS AND METHOD FOR LIFTING A BOP FROM A WELLHEAD

William A. Terry, 4620 Foxboro Ave., Bakersfield, Calif. 93309

Filed Aug. 24, 1977, Ser. No. 827,166
Int. Cl.[2] E21B *33/03*
U.S. Cl. 166—315 **4 Claims**

4. A method of lifting a BOP from a wellhead located within the confines of a drilling-rig sub-base having a rig floor including a network of I-beams each having a lateral lip, said method comprising the steps of:
locating a vehicle adjacent said wellhead, said vehicle having a reservoir of hydraulic fluid and a hydraulic pump provided thereon, said reservoir and said pump each including a fluid outlet and a fliuid inlet;
connecting said reservoir outlet to said pump inlet;

connecting said reservoir inlet to an outlet on a fluid-distribution valve;
connecting said pump outlet to an inlet on said fluid-distribution valve;
connecting first, second, third and fourth inlet-outlet ports on said valve to first, second, third and fourth hydraulic



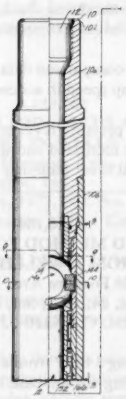
rams, respectively, each of said hydraulic rams including a cylinder and a piston rod;
connecting each of said cylinders to a lip on an I-beam;
connecting each of said pistons rods to said BOP; and
positioning said valve to direct flid from said pump to said rams.

4,125,165

ANNULUS PRESSURE CONTROLLED TEST VALVE WITH LOCKING ANNULUS PRESSURE OPERATED PRESSURE TRAPPING MEANS

Sydney S. Helmus, London, England, assignor to Baker International Corporation, Orange, Calif.

Filed Jul. 21, 1977, Ser. No. 817,805
Int. Cl.² E21B *43/12, 47/00*
U.S. Cl. 166—323 **25 Claims**



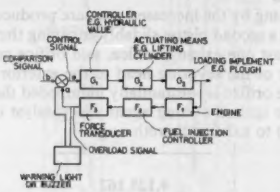
1. Well test apparatus having, in a well, an annulus thereabout comprising:
tubular housing means having valve means therein for the control of fluid flow therethrough;
a pressure chamber within said housing;
trapping means responsive to annulus pressure for trapping pressure in said pressure chamber;
locking means for maintaining said pressure trapping means in the trapping condition with variations in annulus pressure; and
control means responsive to trapped pressure in said pressure chamber and to annulus pressure for control of said valve means.

4,125,166

CONTROL SYSTEM AND METHOD FOR LOADING OF ENGINE DRIVEN APPARATUS

Rauno Bergius, Koivikkotie 17, 40250 Jyvaskyla 25, Finland

Continuation-in-part of Ser. No. 570,479, Apr. 22, 1975, abandoned, Continuation-in-part of Ser. No. 415,531, Nov. 13, 1973, abandoned. This application Feb. 25, 1977, Ser. No. 771,929
Claims priority, application Finland, Nov. 15, 1972, 3215/72
Int. Cl.² A01B *63/112*
U.S. Cl. 172—1 **7 Claims**



1. In a method of operating an apparatus driven by an engine having a fuel injection pump which includes a maximum fuel feed limiting means, a stop, and means urging said maximum fuel feed limiting means against said stop when an overload is imposed on the engine, and a means for regulating an external load on the engine, the steps of detecting the force with which said maximum fuel feed limiting means is urged against said stop when an overload is imposed on the engine, so that the detected force can be utilized for regulating the load imposed on the engine, converting the detected force into a signal proportional to said force, transmitting said signal to said regulating means, and operating said regulating means in response to said signal for reducing the external load when an overload is imposed on the engine.

4. In an apparatus driven by an engine having a fuel injection pump, maximum fuel feed limiting means in said fuel injection pump, a stop, means urging said maximum fuel feed limiting means against said stop when an overload is imposed on the engine, detecting means connected with said stop for detecting the force with which said maximum fuel feed limiting means is urged against said stop, so that the detected force can be utilized for regulating the load imposed on the engine, and a control system comprising a means for regulating an external load on the engine, means connected with said detecting means for producing a signal proportional to the detected force, and means transmitting said signal to said regulating means for controlling said regulating means to reduce the external load when an overload is imposed on the engine.

4,125,167

BIG HOLE BIT

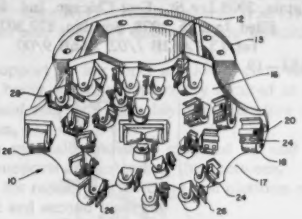
Robert F. Evans, La Habra, and James H. Allen, Lakewood, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Jun. 6, 1977, Ser. No. 803,700
Int. Cl.² E21C *9/00, 7/06*
U.S. Cl. 175—65 **17 Claims**

14. In drilling large diameter bores in the earth using a plurality of rotatably mounted cutters on the bottom of a drill bit,

a method of removing cuttings and debris from the bottom of the drill bore comprising the steps of:

circulating drilling fluid across the bottom of the drill bore beneath the bottom of the drill body adjacent the cutters; and



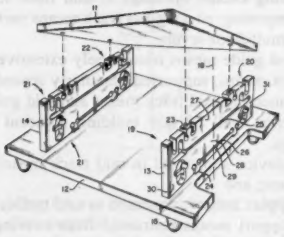
moving magnetic means over the bottom of the drilling bore attached to the bottom of said drill body with the magnetic means being close to the bore bottom, said magnetic means being positioned adjacent each of said cutters so that as the drill bit is rotated, the magnetic means leads the cutters.

4,125,168

LOAD CELLS FOR FLEXURE ISOLATED ELECTRONIC SCALE

Alfred N. Ormond, 11969 E. Rivera Rd., Santa Fe Springs, Calif. 90670

Filed Aug. 4, 1977, Ser. No. 821,631
Int. Cl.[2] G01G *3/14*; G01L *5/12*
U.S. Cl. 177—211 **4 Claims**



1. A load cell including, in combination:

(a) an end body portion for receiving a load;

(b) a vertically stationary central body portion;

(c) first, second and third parallel horizontal elements positioned respectively one below the other in spaced relationship connecting said end body portion to said central body portion, said first and third elements constituting horizontal flexure webs, and said second element being disposed therebetween to function as a load element;

(d) strain gauge means secured to said load element and responsive to strains developed therein resulting from a downwardly directed load on said end portion tending to move said end portion downwardly relative to said central body portion to provide electrical signals constituting a function of said load, said first and third horizontal flexure webs constraining movement of said end body portion relative to said central body portion to a vertical rectilinear direction to isolate extraneous shear forces from said second horizontal element;

(e) an additional end body portion connected to an opposite end of said central body portion by first, second and third horizontal elements identical to said first mentioned first, second and third horizontal elements to provide two load cells symmetrical with respect to a vertical axis passing midway through said central body portion, said central body portion with its connected end portions defining a first generally rectangular member;

(f) a second generally rectangular member with flexure connected opposite end body portions identical to said first member, said members lying in vertical spaced planes;

(g) a horizontal load plate; and,

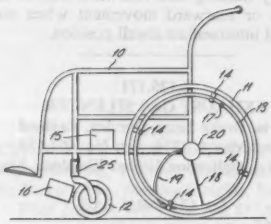
(h) a horizontal base plate disposed beneath said load plate in spaced parallel relationship, said generally rectangular members being disposed between said load plate and base plate to provide an electronic weighing scale.

4,125,169

WHEELCHAIRS

John D. Harris, Abingdon; Michael F. Fogden, Marston, and Graham E. Mead, Oxford, all of England, assignors to National Research Development Corporation, London, England

Filed Jun. 9, 1977, Ser. No. 805,144
Claims priority, application United Kingdom, Jun. 17, 1976, 25118/76
Int. Cl.[2] B62D *11/04*
U.S. Cl. 180—6.5 **5 Claims**



1. A wheelchair comprising:

a pair of larger ground-engaging wheels mounted on opposite sides of the wheelchair;

a pair of handwheels mounted adjacent the respective rims of said ground-engaging wheels for rotational movement relative thereto from a datum position against a spring bias;

a pair of ground engaging castor wheels smaller than said larger wheels and mounted on opposite sides of the wheelchair;

a pair of motors respectively drivably coupled with said castor wheels on opposite sides of the wheelchair;

a power source for said motors, which source is mounted on the wheelchair;

and a pair of switch mechanisms individually connected between a respective one of said handwheels, a respective one of said motors, and said power source, for operation in response to said relative rotational movement of the respective handwheel to energise the respective motor.

4,125,170

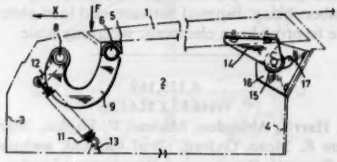
FORWARDLY PIVOTING BONNET OR HOOD FOR A MOTOR VEHICLE

Hans D. Botz, Eindhoven, Netherlands, assignor to Volvo Car B.V., Geldrop, Netherlands

Filed Jun. 8, 1977, Ser. No. 804,551
Claims priority, application Netherlands, Jun. 22, 1976, 7606761
Int. Cl.[2] B62D *25/10*
U.S. Cl. 180—69 C **8 Claims**

1. In a motor vehicle having a bonnet and a body, means for mounting the bonnet to the vehicle, said bonnet being one which opens by pivoting upwardly and forwardly, said means comprising: a hinge having a strap member, said strap member being pivotally mounted at its forward end to said body and at its rearward end to the front end of said bonnet; said strap

member as it pivots upwardly about its forward end lifting said bonnet and shifting it forwardly; means biasing said strap to pivot upwardly and forwardly; a bracket secured to the underside of said bonnet to provide the pivotal mounting for said bonnet, said bracket having a rear shoulder thereon, said strap having a rear shoulder thereon, said shoulders being positioned to engage each other when the bonnet and strap are at an



intermediate dwell position and when engaged forming a stop limiting said pivotal movement of said strap at the intermediate dwell position under the influence of said biasing means; a catch at the rearward end of said bonnet, said catch having means positively holding said rearward end of said bonnet against upward or rearward movement when said strap is rearward of said intermediate dwell position.

4,125,171

EXHAUST GAS SILENCER

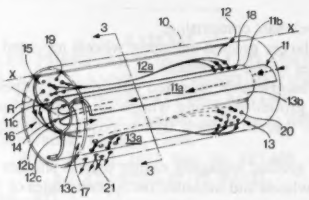
Alberto J. Morris, Drake Lane, Dursley, England

Filed May 6, 1974, Ser. No. 467,128

Claims priority, application United Kingdom, Aug. 23, 1973, 39900/73

Int. Cl.[2] F01N *1/08*

U.S. Cl. 181—265 **7 Claims**



1. An exhaust gas silencer comprising a tubular casing defining an inner wall, a plurality of baffle plates arranged in said casing, each baffle plate comprising an inner portion and an outer portion, said inner portions defining a central chamber extending longitudinally of the tubular casing, the outer portion of each baffle plate extending between the central chamber and said inner wall to meet the inner wall along a line which is circumferentially spaced from any radius extending from the longitudinal axis of the central chamber through the juncture of the inner and outer portions of the baffle plate, a curved surface defined by said outer portion, said curved surface extending from a position adjacent said juncture to said line to meet the inner wall of said casing substantially tangentially, a plurality of outer chambers defined jointly by said inner wall and said baffle plates to extend longitudinally of said casing, said chambers connected in series to define a tortuous path for exhaust gas to follow between the central chamber and the last chamber of said series connected outer chambers, an inlet passage and an outlet passage defined by said exhaust gas silencer, one of said passages communicating with said central chamber, and the other of said passages communicating with said last chamber and in which the inner portion of each baffle plate extends between the outer portions of each adjacent pair of baffle plates to a position closer to the inner wall of said casing than said junctures and in which the eccentricity of the central chamber wall is approximately equal to one quarter of the radius of a notional cylinder on the surface of which lie said junctures of the inner and outer portions of each baffle plate.

4,125,172

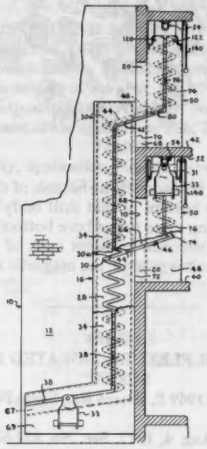
EMERGENCY ESCAPE APPARATUS

Walter Hatala, 3905 Ivy St., East Chicago, Ind. 46312

Filed Jan. 25, 1978, Ser. No. 872,302

Int. Cl.[2] A62B *1/02*; B66B *9/00*

U.S. Cl. 182—19 **20 Claims**



1. An emergency escape apparatus for a multi-floor level building having escape openings at said floor levels of said building, comprising: p1 a zig-zag track means vertically extensive of said multifloor levels;

a rectilineal guide means transversely extensive of said zig-zag track means, supported planularly spaced therefrom;

means connecting said track means and said guide means to an exterior wall of said building adjacent said escape openings;

a trolley device supported in said track means for zig-zag movement; and

a body support means connected to said trolley device, said body support means restrained from moving zig-zag by said rectilineal guide means.

4,125,173

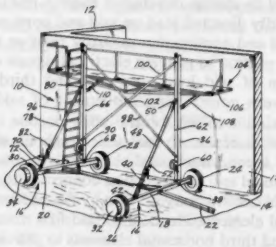
SCAFFOLD DEVICE

Willard J. Rust, and Willard M. Rust, both of R.R. 2, Spencer, Nebr. 68777

Filed Dec. 11, 1975, Ser. No. 639,921

Int. Cl.[2] E04G *1/20, 1/24*

U.S. Cl. 182—63 **9 Claims**



1. A scaffold device, comprising,

a wheeled frame means comprising a front axle assembly and a rear axle assembly, said front and rear axle assemblies being pivotally connected together about a horizontal axis whereby one of said axle assemblies may be pivoted relative to the other,

a first support having upper and lower ends, said first support being selectively pivotally secured at its lower end to said front axle assembly and extending upwardly therefrom,

a second support having upper and lower ends, said second support being selectively pivotally secured at its lower end to said rear axle assembly and extending upwardly therefrom,

a platform vertically movably mounted on said first and second supports and extending therebetween,

and means for raising and lowering said platform relative to said first and second supports.

4,125,174

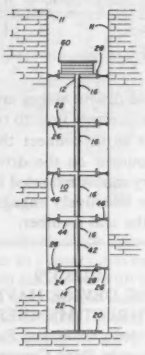
SCAFFOLDING FOR USE IN A CONFINED AREA

Robert W. Lienhard, Pittsburgh, Pa., assignor to Swiss Fabricating, Inc., Pittsburgh, Pa.

Filed Jul. 15, 1977, Ser. No. 816,040

Int. Cl.[2] E04G *1/06, 1/12, 1/36*

U.S. Cl. 182—128 **16 Claims**



1. A scaffolding for use in an area having relatively closely spaced sidewalls comprising:

at least a pair of vertical members disposed between the sidewalls;

a first horizontal member connected to each vertical member; and,

horizontal adjusting means formed with each horizontal member for extending out from each horizontal member to engage the sidewalls and prevent movement towards or away from the sidewalls by the supported scaffolding.

4,125,175

STAIRCASE WITH SMALL BASE AREA

Herbert Ernst, Burgstr. 7, 7765 Bodman, Bodensee, Germany

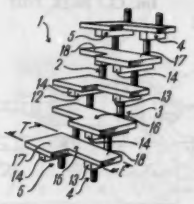
Filed Jan. 19, 1977, Ser. No. 760,505

Claims priority, application Switzerland, Jan. 20, 1976, 626/76

Int. Cl.[2] E04F *11/00*

U.S. Cl. 182—194 **10 Claims**

1. A staircase comprising at least one stringer and a succession of horizontal treads mounted on said stringer in vertically spaced relation, each of said treads having a wide tread portion along part of its length and a setback portion along another part of its length, the wide tread portions of the successive treads of the staircase alternating from side to side along the latter, said stringer comprising at least one horizontal support member carrying each of said treads and respective vertical members, interconnecting a successive support member at opposite ends thereof, the vertical members connected to each support member having a center-to-center spacing no greater than the width of said wide tread portions, two parallel stringers being disposed to the opposite sides of a vertical median



plane through the staircase, the support members of each tread in the narrow tread portion thereof being shorter than the support member of each tread in the wide tread portion thereof.

4,125,176

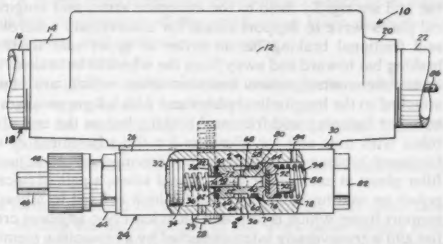
INJECTION TYPE LUBRICATING APPARATUS

George E. Thrasher, Jr., Pontiac, Mich., assignor to Master Pneumatic-Detroit, Inc., Sterling Heights, Mich.

Filed Jul. 21, 1977, Ser. No. 817,802

Int. Cl.[2] F16N *13/16*

U.S. Cl. 184—56 A **8 Claims**



7. In a lubricator having a body with a lubricant inlet which opens into a guideway for a pump plunger reciprocable to force a predetermined quantity of lubricant intermittently through an outlet in said body, improved structure wherein,

said body has an internal chamber defined in part by a circumscribing side wall having an aperture which forms a part of said inlet,

an insert in said chamber having exterior peripheral surface portions fitted within said side wall,

said insert having an axial opening therein aligned with said plunger and forming said guideway,

said insert having an exterior peripheral groove forming a portion of said inlet,

said insert having a port which extends between said groove and guideway to form the downstream portion of said inlet,

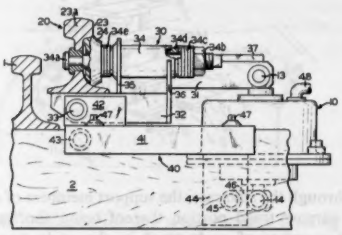
said port having a cross dimension which is small as compared to that of said guideway,

and seal means between the interior of said chamber and the exterior of said insert located in axially opposite directions from said groove.

4,125,177
RAILWAY BRAKING APPARATUS

Jean F. Durraffourt, Plessis Trevise, France, assignor to WABCO Westinghouse, Freinville-Sevran, France

Filed Mar. 21, 1977, Ser. No. 779,700
Int. Cl.[2] B61K 7/02
U.S. Cl. 188—62 16 Claims



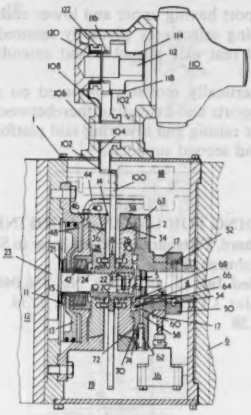
1. Railway braking apparatus for retarding railroad vehicles, of the type which comprises, at least one frictional braking bar disposed parallel to track rails and supported by the crossties, at least one power operated actuator, having a body, for moving the frictional braking bar into and out of engagement with the wheels of railroad vehicles traversing the track rails through the intermediary of a mechanical transmission means, characterized in that said mechanical transmission means includes a pivotal brake lever which is linked to one end of said power operated actuator and which is located in a median plane above the upper part of the crossties at a small distance therefrom, said brake lever includes a welded frame which supports and controls the frictional braking bar with respect to the wheel to be braked, said welded frame includes at least two transverse extension arms for receiving on an overhang portion the frictional braking bar and being crossbraced by several longitudinal plates which are parallel to said frictional braking bar and are rigidly fixed to the extension arms, said longitudinal plates serve to support means for transversely controlling said frictional braking bar in order to move said frictional braking bar toward and away from the wheel to be braked, said transverse control means includes tubes which are rigidly attached to the longitudinal plates and which form passages for bolts for fastening said frictional braking bar on the end of the tubes with nuts and for allowing for the adjustment of said frictional braking bar through the intermediary of adjusting filler plates at each of the ends of said tubes, a pair of fulcrum points on said brake lever each of which is fixed to a bearing support frame which is disposed on at least two adjacent crossties and is transversely interconnected by a crosspiece member, said power operated actuator is located between said two adjacent crossties with another end linked to a reaction support which is fixed to the two adjacent crossties in such a manner so as to place the body of said power operated actuator below the upper part of the lever and between the crossties so as to sustain the longitudinal and transverse reaction force which is transmitted by the wheels of the railroad vehicles to the frictional braking bar.

4,125,178
DRIVE MECHANISM

Harry Monks, Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Dec. 23, 1976, Ser. No. 753,895
Claims priority, application United Kingdom, Jan. 15, 1976, 01569/76
Int. Cl.[2] F16D 67/04
U.S. Cl. 192—18 A 7 Claims

1. A drive mechanism for a conveyor including a casing and a primary motor; a driving stage mounted within the casing to be rotated by said motor; a driven stage mounted within the casing and adapted to drive a machine; a clutch interposed between the driving and driven stages and adapted drivably to connect the driven to the driving stage; a brake located on the driven stage and biased to its applied position; control means including a control valve, a pump adapted to deliver pressure fluid and drivably connected to the driving stage, the control valve being connected to receive pressure fluid from the pump; the control means being connected so that, in operation, after the motor is started, the brake will move to its released position

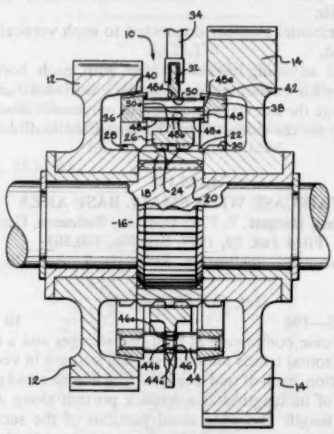


before the driving and driven stages are drivably connected, means actuated by the pressure fluid to release the brake and to engage the clutch so as to connect the driving and driven stages; a member mounted on the driven stage for rotation therewith; an auxiliary motor mounted in association with the casing, and means for selectively engaging drive between the auxiliary motor and the said member.

4,125,179
SYNCHRONIZING DEVICE HAVING SPRING PIN THRUST MEMBERS

Phillip R. Cochran, Toledo, Ohio, and Paul J. Ashburn, Petersburg, Mich., assignors to Dana Corporation, Toledo, Ohio

Filed Jul. 25, 1977, Ser. No. 818,771
Int. Cl.[2] F16D 23/06
U.S. Cl. 192—53 E 10 Claims



1. A synchronizing device, comprising:
a shiftable coupling collar;

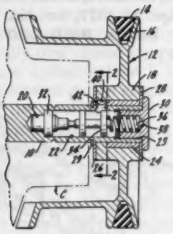
a first and second set of openings in said coupling collar;
a pair of friction rings located on opposite sides of said coupling collar;
a connecting pin disposed in said first set of openings having outer ends secured to said pair of friction rings;
co-acting blocking means on said connecting pins and in said first set of openings;
C-shaped spring pins disposed in said second set of openings having outer ends in butting engagement with said pair of friction rings;
ribs integral with said spring pins and spaced on opposite sides of said second set of openings defining an annular guide portion therebetween frictionally contacting said second set of openings.

4,125,180

DISCONNECT MECHANISM FOR COMPRESSOR DRIVE

Richard W. Roberts, Lombard, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 13, 1976, Ser. No. 749,942
Int. Cl.[2] F16D *43/25*
U.S. Cl. 192—82 T **7 Claims**



1. A disconnect mechanism for interrupting drive from a rotary driving member to a rotary driven member, said mechanism comprising: a hub associated with said driving member; a shaft associated with said driven member; a bearing means supporting said hub on the O.D. of said shaft, at least one pin member capable of assuming a first position in which is is interengaged with both said shaft and said hub to form a driving connection therebetween and a second position in which said pin member is out of engagement with either said hub or said shaft; pin member support means for supporting said pin member in said first position; and temperature responsive means adapted to urge said pin member support out of position causing said pin member to assume irreversibly said second position whereby said hub is permitted to freely rotate on said bearing means.

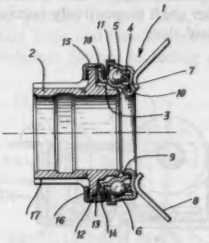
4,125,181

CLUTCH DISENGAGING DEVICE HAVING A SELF-CENTERING CLUTCH PRESSURE BEARING

Karlheinz Stenzinger, Hesselbach, Fed. Rep. of Germany, assignor to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 21, 1977, Ser. No. 779,695
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1976, 7608859[U]
Int. Cl.[2] F16D *19/00*
U.S. Cl. 192—98 **10 Claims**

1. In a clutch disengaging device including a sliding sleeve assembly and a self-centering clutch pressure bearing which includes a stationary bearing ring, the improvement wherein said bearing ring and sliding sleeve assembly comprise first and second adjacent facing alignment surfaces respectively and corresponding first and second adhesive means on both of said alignment surfaces, said two adhesive means being bondable together when said facing alignment surfaces are urged together, said pressure bearing and sliding sleeve assembly and their respective alignment surfaces being radially movable relative to each other for centering said bearing during assembly of this device, and being radially fixed after said adhesive means are bonded together.

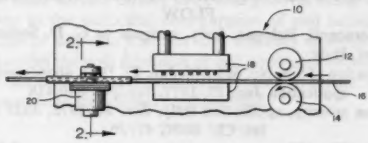


4,125,182

PUNCH PRESS CONTROLLER

Janusz R. Karlowicz, 2331 N. Kedzie Ave., Chicago, Ill. 60647

Filed Oct. 11, 1977, Ser. No. 840,564
Int. Cl.[2] B26D *5/00*; H01H *29/26, 35/10*
U.S. Cl. 192—125 A **15 Claims**



1. A punch press controller for stopping a punch press when buckling or jamming of the work piece takes place in the punch press, said controller comprising:
rotating means;
a roller rigidly connected to said rotating means and frictionally engaging said work piece;
means for maintaining the work piece exiting from the punch press against said roller;
a movable element operatively associated with said rotating means; and
a switch actuated by said movable element, said roller converting the linear motion of the work piece exiting from the punch press into rotational motion of said rotating means, the rotational motion of said rotating means generating centrifugal force of a sufficient magnitude to maintain the movable element in an operating position only as long as the work piece is exiting from the press, said movable element moving to actuate said switch turning off the press as soon as the work piece stops exiting from the press, so that the controller is powered solely by the motion of said work piece.

4,125,183

ROLLER ASSEMBLY

Robert D. Lang, 633 Lido Park, B-1, Newport Beach, Calif. 92663

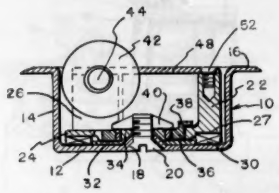
Filed Aug. 22, 1977, Ser. No. 826,467
Int. Cl.[2] B65G *39/02*
U.S. Cl. 193—37 **8 Claims**

1. A load bearing roller assembly comprising:
a cup housing to be received in apertures of a support plate and having a bottom wall, cylindrical side wall and an annular flange about its upper edge;
a roller support received within said housing with an annular base wall and a pair of spaced-apart upright standards;

annular bearing means captured between said base wall of said roller support and bottom wall of said housing;

roller-shaft-receiving slots on opposed faces of said standards and open at the upper ends thereof;

a roller and roller shaft respectively received between said faces and in said slots;



assembly retainer means including fastener means extending through a central aperture in said housing bottom wall and a ring retainer overlying said roller support base wall; and

a cover plate secured to the top faces of said standards with a radial slot to receive said roller and overlie said opposed slots and retain said roller shaft.

4,125,184

SWITCHING DEVICE FOR SWITCHING A CIGARETTE FLOW

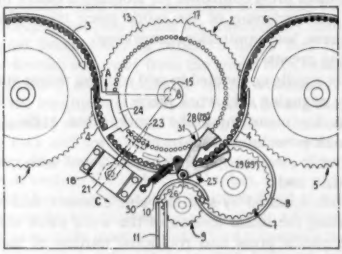
Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Italy

Continuation of Ser. No. 651,346, Jan. 22, 1976, abandoned. This application Jun. 27, 1977, Ser. No. 810,418

Claims priority, application Italy, Jan. 29, 1975, 3325 A/75

Int. Cl.[2] B65G *47/26*

U.S. Cl. 198—442 **3 Claims**



1. A device for rapidly switching a continuous flow of newly manufactured cigarettes, comprising:

a first cigarette conveying wheel continuously rapidly rotated in one direction and having a first circumferential portion constituting a part of one path of a flow of cigarettes, disposed transversely of the path;

a second cigarette conveying wheel, tangential to said first wheel, continuously rapidly rotated in an opposite direction and having a second circumferential portion constituting a part of another path for the flow with cigarettes disposed transversely of the other path, the two circumferential portions defining a switching zone therebetween;

a unitary bifurcated switching member disposed between the wheels and rapidly movable in the switching zone about a single axis transverse to said paths and parallel to the cigarettes, said switching member having two rigidly interconnected arms, an upper one and a lower one, on one side of said cigarette conveying wheels and, rigidly connected with said arms, two additional rigidly interconnected arms, an upper one and a lower one, on the other side of said cigarette conveying wheels, the upper arms defining a guide surface facing and shaped to surround said second circumferential portion, and the lower arms defining a guide surface facing and shaped to surround said first circumferential portion; and

drive means for the rapid moving of said unitary bifurcated switching member to alternately position the guide surfaces of the arms thereof adjacent said first and second circumferential portions of the cigarette conveying wheels for thereby effecting rapid switching of the flow alternately to said one and other path while the rapid rotation of the cigarette conveying wheels continues.

4,125,185

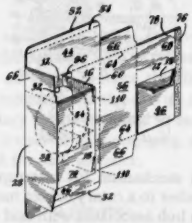
DIVIDED DISPLAY CARTON AND BLANK THEREFOR

Robert A. Bliss, St. Paul, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Apr. 21, 1977, Ser. No. 789,492

Int. Cl.[2] B65D *5/50*

U.S. Cl. 206—45.15 **13 Claims**



1. A display carton comprising:

a front wall, a back wall, a pair of side walls joining said back wall to said front wall, a top wall, and a bottom wall, said top and bottom walls extending between said front and back walls,

hinge means pivotably connecting said top and bottom walls to said front wall,

said back wall being formed from a pair of flaps, each of said flaps being hingedly connected to a sidewall, one of said flaps overlapping the other and being adhesively secured to the other,

a central divider wall hingedly connected to said overlapped one of said back wall flaps and folded to a position extending between said front and back walls generally parallel to said side walls dividing the interior of said carton between said side walls into a pair of compartments adapted to receive a plurality of articles therein,

a shelf in each of said compartments hingedly connected to a panel which is hingedly connected to an edge of each of said back wall flaps and folded to a position extending between said front and back walls in a plane substantially perpendicular to said divider wall, said shelves being disposed substantially midway between said top and bottom walls and substantially parallel thereto, each shelf being adapted to support an article thereon in each of said compartments between said shelf and said top wall and to provide a divider for an article supported on said bottom wall between said bottom wall and said shelf, and

a display opening cut in said front wall to expose the articles within each of said compartments to view.

4,125,186

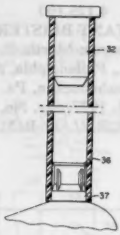
PHARMACEUTICAL DELIVERY SYSTEM

Eugene J. Meierhoefer, Hackettstown, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 818,042, Jul. 22, 1977, abandoned, which is a continuation of Ser. No. 615,450, Sep. 22, 1975, abandoned. This application Mar. 10, 1978, Ser. No. 885,154

Int. Cl.[2] B65D *25/08*

U.S. Cl. 206—221 **5 Claims**



1. A single use container for antiseptic application of a pharmaceutically acceptable diluent, the container comprising a molded deformable translucent plastic bottle generally oval in cross-section and having a planar generally oval closed bottom portion and a generally oval closed top portion, said top portion having a hollow cylindrical neck extending upwardly therefrom and being located on the longitudinal axis and offset from the center of the oval top portion, said neck having integral closure means aseptically sealing the interior of the container from its environment, the closure means being discoidal in shape and having a greater diameter than the cross-sectional diameter of the neck the closure means being attached to the neck along a weakened portion at the junction of the neck and closure means, the closure means having integral bar means parallel to the generally oval bottom portion of said container and extending along a plane passing through the longitudinal diameter of the container's cross section for removing the closure from the neck about said weakened junction, said container further having an integral tab extending downwardly from the bottom portion and extending completely across the bottom portion along the longitudinal diameter of the generally oval cross section, wherein the exterior of said bottle contains raised portions extending parallel to said bottom portion and aligned longitudinally along said exterior, said raised portions functioning to represent graduations whereby the volume of any material within the container may easily be ascertained, said neck of the container being offset from the central axis of the bottle defining opposite shoulders extending from the neck to the outer most generally oval cross-section of said container in such a manner that the shoulder extending in the same direction as the bar means is longer than the remaining shoulder, said neck further having integral primary sealing means located at the junction of said container and neck portion and secondary sealing means located at the upper most portion of said neck and being exposed after the closure means is removed from said neck portion wherein the primary and secondary sealing means cooperates with an open ended hollow cylindrical pharmaceutical unit dose package when said package and container are attached for use.

4,125,187

THERMOPLASTIC CASING AND METHOD OF MANUFACTURING SAME

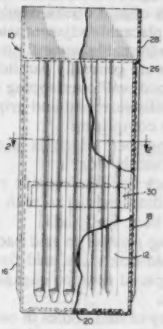
Camillo M. Vecchiotti, Ridgewood, N.J., assignor to Amerace Corporation, New York, N.Y.

Filed Oct. 21, 1974, Ser. No. 516,420

Int. Cl.[2] B65D *85/30*

U.S. Cl. 206—333 **2 Claims**

1. A battery casing comprising a hollow, acid resistant enclosure molded integral from a polycarbonate material, said enclosure including a base, a plurality of side walls extending from said base and an access opening disposed remotely from said base, at least a portion of each of said side walls having a sinusoidal cross-sectional configuration as defined by the intersection of said portion with a plane passing through said portion substantially parallel to said base, said portion being spaced proximately from said base and extending toward said opening, said enclosure further including a reinforcing strip



affixed to a surface of at least one of said side wall portions wherein said reinforcing strip includes a plurality of grooves on the inner surface of said strip, said grooves being complementary to the sinusoidal configuration of said surface of at least one of said side wall portions whereby said reinforcing strip enables the wall thickness of said portion to be less than it otherwise would be in order to substantially maintain said side wall portion in its original configuration.

4,125,188

STACKABLE STRAPPING FASTENER

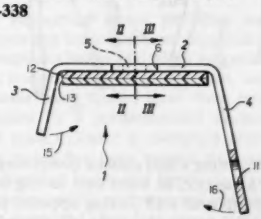
Alfred Greiner, Konigsberger Strasse 68, D 7302 Ostfildern 2 - Nellingen, Germany

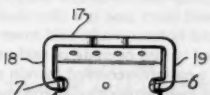
Filed Nov. 1, 1976, Ser. No. 737,263

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1975, 2549975

Int. Cl.[2] B65D *85/00, 63/06*

U.S. Cl. 206—338 **3 Claims**





2. The combination including a plurality of stackable fasteners for connecting parallel adjacent bands and a magazine for retaining said fasteners comprising

a plurality of fastener bodies each comprising

a rectangular, planar central wall and first and second rectangular, planar side walls,

said central wall having parallel side edges, parallel end edges shorter than said side edges and first and second major faces,

said side walls being integrally formed with said central wall and attached to said central wall along said side edges to form a generally U-shaped body;

said side walls extending away from the same one of said major faces and diverging away from each other,

means for defining inwardly extending guide recesses in said end edges of said central wall;

said body being placeable adjacent said bands and said side walls being deformable inwardly to a position in which said side walls are generally parallel to said central wall with said second wall overlapping said first wall and in which said walls surround and grip said bands;

and said magazine comprising

an elongated member which is generally C-shaped in cross-section and having

an elongated back wall having side edges,

side walls extending parallel to each other from said side edges of said back wall and

flanges extending parallel to said back wall toward each other from said side walls, said flanges having parallel distal edges spaced apart to engage said guide recesses in said bodies,

whereby a plurality of said bodies in nested relationship are insertable into said magazine and movable in a direction parallel with said back wall and said distal edges.

4,125,189

TAPE CASSETTE CASE

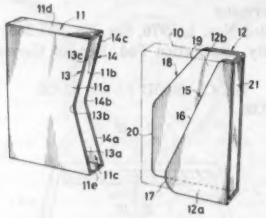
Kazumi Fujimoto, Hino, and Toshio Iribe, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 29, 1977, Ser. No. 810,978

Claims priority, application Japan, Oct. 22, 1976, 59/141177[U]

Int. Cl.² B65D *85/67*

U.S. Cl. 206—387 **8 Claims**



1. A case for storing a tape cassette comprising: an inner case for receiving a cassette; an outer case having top and bottom walls and a peripheral wall joining opposite portions of the peripheries of said top and bottom walls for defining an opening at one side of said outer case through which said inner case with a cassette received therein can be slidably inserted into and removed from said outer case in a direction parallel to the planes of said top and bottom walls; said inner case having a side member disposed in said opening of said outer case when said inner case with a cassette received therein is stored in said outer case, said inner case further having top and bottom panel members extending to different lengths from said side member to be disposed against respective top and bottom surfaces of a cassette when the latter is received in said inner case with said side member overlying a side of the cassette, said top wall and said top panel member having edge portions remote from said peripheral wall and side member, respectively, which are angled in respect to each other, and said bottom wall and said bottom panel member having edge portions remote from said peripheral wall and said side member, respectively, which are angled in respect to each other, an edge portion of at least one of said panel members forming an angle with respect to a base line which is greater than the angle formed between said base line and a corresponding edge portion of said outer case so that an edge portion of said inner case at least initially passes a corresponding edge portion of said outer case at only one point as said inner case with a cassette therein is slidably inserted through said opening of said outer case for storing of the cassette, whereby said inner case with a cassette received therein is more easily insertable into said outer case.

4,125,190

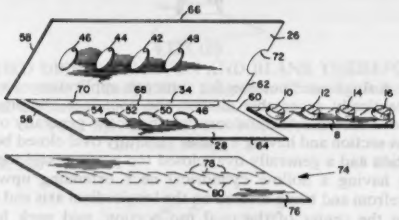
CHILD-RESISTANT BLISTER PACKAGE

John H. Davie, Jr., Gladwyne; Martin E. Hulick, Berwyn, and Stephen J. Verespy, Jr., Philadelphia, all of Pa., assignors to Sharp Corporation, Conshohocken, Pa.

Filed Aug. 3, 1977, Ser. No. 821,333

Int. Cl.² B32B *31/00*; B65D *83/04*

U.S. Cl. 206—532 **10 Claims**



1. A card for use in a child-resistant blister package comprising a first substantially flat paperboard sheet having a first hole extending from one face to the opposite face thereof, and a second substantially flat paperboard sheet having a second hole extending from one face to the opposite face thereof, said first and second sheets being integrally connected together by at least two narrow hinge sections, said hinge sections being spaced from each other and adapted to permit said sheets to be folded over on each other to secure a blister sheet between them, said holes being positioned so that they become coaxially aligned when said sheets are folded over on each other, both of said sheets being coated, at least on those portions of their faces which come into contact with each other, by a heat-sealable adhesive, and said second sheet having dimensions such that, when folded over on said first sheet, a margin area of said first sheet is presented which extends substantially entirely around the periphery of said second sheet, said margin area also being coated by a heat-sealable adhesive, the adhesive coating within said margin extending substantially entirely around the periphery of said second sheet.

6. The method of making a child-resistant blister package for medicinal tablets and similar articles comprising the steps of:

providing a first paperboard sheet having a first hole extending from one face to the opposite face thereof, and a heat-sealable adhesive coating on one face thereof;

positioning a foil-backed blister sheet on the adhesive-coated side of said first sheet with its blister extending through said hole;

positioning a second paperboard sheet, having a second hole extending from one face to the opposite face thereof, against the adhesive-coated side of said first sheet with said first and second holes in coaxial alignment, thereby clamping said foil-backed blister sheet between said first and second sheets;

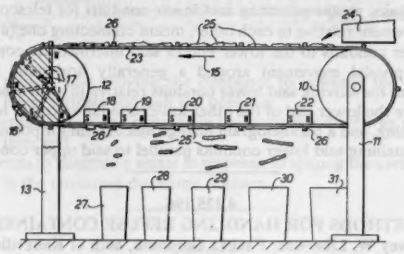
heat-sealing said first and second sheets together; and

securing a third paperboard sheet having a removable section against the exposed face of said second sheet by heat-sealing said third sheet to a margin area of said first sheet said margin area extending beyond the borders of said second sheet throughout substantially the entire periphery thereof.

4,125,191
MAGNETIC SEPARATION OF MATERIALS

John Peace, Guisborough, England, assignor to British Steel Corporation, London, England

Filed Sep. 7, 1976, Ser. No. 720,598
Claims priority, application United Kingdom, Sep. 5, 1975, 36676/75; Sep. 30, 1975, 39968/75
Int. Cl.[2] B07C 5/04
U.S. Cl. 209—609 17 Claims



1. A method for continuously separating various size fragments of ferromagnetic material from one another according to their size including the steps of:

(a) orienting the fragments upon a support surface so their respective longest dimensions extend in a common direction;

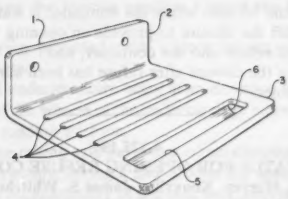
(b) conveying the fragments while they are on the support surface along a line of magnetic devices which maintain the initial orientation of the fragments and which are arranged to attract the fragments to the support surface, the magnetic devices being located along the fragment conveying direction and spaced apart from one another progressively greater distances along the direction of orientation of the longest dimensions of the fragments; and

(c) exposing the fragments to a force tending to separate the fragments from the support surface at least when the fragments pass between adjacent magnetic devices spaced apart a sufficient distance such that their magnetic influence is insufficient to retain the smaller of the passing fragments on the support surface.

4,125,192
GAME EQUIPMENT SUPPORT RACK

John Dayen, 13810 N. 31 Ave., Phoenix, Ariz. 85023

Filed Jun. 6, 1977, Ser. No. 803,547
Int. Cl.[2] A47F 7/00
U.S. Cl. 211—14 8 Claims



1. A game apparatus holder comprising:

a. a vertical member having a means for attaching the same to a wall or other surface;

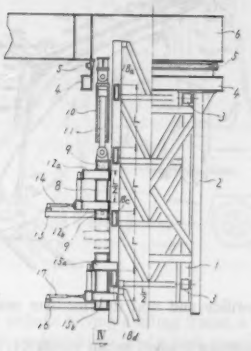
b. a horizontal member depending from said vertical member having a plurality of slots spaced apart; and

c. an elongated "U" shaped member attached at its arms to the lower surface of said horizontal member, each arm of said U-shaped member extending along opposite sides of at least one of said slots to thereby define a trough-like receptacle beneath said slot.

4,125,193
CLIMBING DEVICE FOR CLIMBING CRANE

Shigeto Matsumoto, Kawaguchi, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Ote, Japan

Filed Oct. 11, 1977, Ser. No. 841,114
Claims priority, application Japan, Oct. 15, 1976, 51-138416[U]
Int. Cl.[2] B66C 23/02
U.S. Cl. 212—64 6 Claims



1. A climbing device for a climbing crane comprising

(a) a guide frame mounted on a mast for vertical movement,

(b) a movable frame mounted on said guide frame for vertical movement along guide rails attached to said guide frame,

(c) a main cylinder having the upper end pivoted to the upper end of said guide frame and having the lower end connected to said movable frame,

(d) an upper supporting means including two vertically spaced supporting arms which are mounted on said movable frame for movement into and away from said mast, and

(e) a lower supporting means including two vertically spaced supporting arms which are mounted on said guide frame immediately below said upper supporting means for movement into and away from said mast, said lower supporting means being spaced apart from said upper supporting means by a predetermined distance, whereby when said main cylinder is energized after said lower supporting means has been moved into said mast, said movable frame and hence said upper supporting means is caused to move upward or downward and when said main cylinder in energized after said upper supporting means has been moved into said mast said guide frame and hence said lower supporting means is caused to move upward or downward.

4,125,194
TORQUE ARM ASSEMBLY

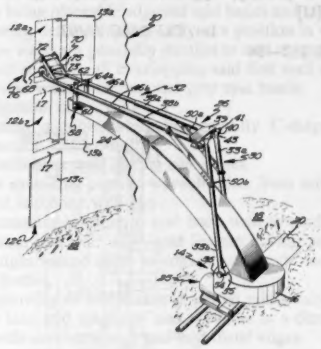
Raymond R. Price, Rochester, and Michael A. Elder, Plainview, both of Minn., assignors to Rochester Silo, Inc., Rochester, Minn.

Filed Oct. 26, 1976, Ser. No. 735,696
Int. Cl.[2] B65G 65/38
U.S. Cl. 214—17 DB 17 Claims

1. A torque arm assembly for aiming a silo unloader output chute, said torque arm assembly comprising:

first frame means adapted to be pivotally coupled to said unloader and oriented generally vertically with respect thereto;

tracking frame means for automatically, sequentially engaging silage discharge orifices in response to lowered silage level during silo unloading, said tracking frame means pivotally coupled to said first frame means, and said tracking frame means comprising latching means for temporarily delaying said tracking means in an intermediate position within a lower discharge orifice to be engaged, and a roller wheel for contacting silage discharge orifice partitions during movement of said tracking means between an



upper orifice and said intermediate position in a lower orifice;

wheel mounting bracket means yieldably, pivotally coupled to said tracking frame means to pivot said roller wheel with respect to said tracking frame in response to predetermined pressure; and

suspension means extending between said chute and said torque arm assembly for securing said silage discharge output chute in proper position relative to the silage discharge orifices.

4,125,195

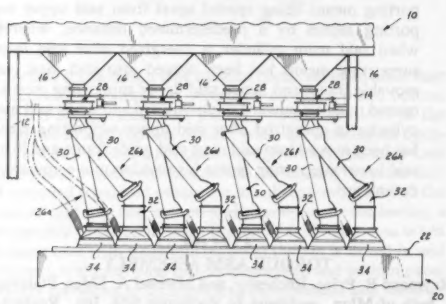
DRY ROCK LOADING SPOUT SYSTEM

John Sasadi, Ramsey, N.J., assignor to EDC Inc., Ramsey, N.J.

Filed Mar. 23, 1977, Ser. No. 780,673

Int. Cl.[2] B65G *11/12, 11/14, 67/06*

U.S. Cl. 214—41 R **18 Claims**



1. Apparatus for conducting dry comminuted material from a bin opening at one level to the opening of a hatch at a given position at a second level including in combination, a frame, an upper conduit, means mounting said upper conduit on said frame at a position to receive material discharged through said opening and for rotary movement around the vertical centerline of said opening, an elongated intermediate conduit, means connecting said intermediate conduit to said upper conduit for swinging movement around a generally horizontal axis, means for moving said upper conduit around said opening axis while moving said intermediate conduit around said horizontal axis so that material slides through said intermediate conduit and whereby the position of the lower end of said intermediate conduit can be described in terms of polar coordinates in a plane of projection in which said end can be moved to a location corresponding to said given position, a pair of lower conduits, means mounting said lower conduits for telescoping movement relative to each other, means connecting one of said lower conduits to the lower end of said intermediate conduit for pivotal movement around a generally horizontal axis, means for moving said lower conduits relative to each other to move the lower end of the other lower conduit into said hatch opening, and a parallelogram linkage mechanism for positively maintaining said lower conduits parallel to said upper conduit.

4,125,196

METHODS FOR HANDLING REFUSE CONTAINERS

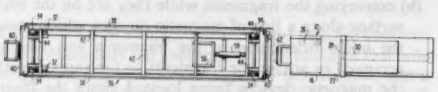
Harvey W. Liberman; Paul L. Goranson, both of Knoxville; R. Houston Ratledge, Jr., Maryville, and John C. Salyers, Oak Ridge, all of Tenn., assignors to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 641,375, Dec. 17, 1975, Pat. No. 4,044,905.

This application May 19, 1977, Ser. No. 798,731

Int. Cl.[2] B65G *65/04*

U.S. Cl. 214—152 **3 Claims**



1. A method of shifting a vertically slidable closure positioned at one end of a refuse container, forming in part thereof, and including a forwardly projecting portion, for use with a refuse packer assembly including a vertically swingable lift arm, comprising the steps of:

advancing the container horizontally toward the refuse packer assembly such that the container contacts the lift arm and urges the lift arm upwardly;

continuing to advance the container horizontally to swing the lift arm upwardly;

engaging an underside of the forwardly projecting portion of the closure with the lift arm;

further advancing the container to further swing the lift arm upwardly to lift the closure through engagement between the forwardly projecting portion of the closure and the lift arm;

raising the lift arm while the container is stationary to further lift the closure to provide an opening for the admission of refuse into the container; and

lowering the closure after refuse has been admitted into the container.

4,125,197

APPARATUS FOR OPENING REFUSE CONTAINERS

Samuel E. Harvey, Knoxville; James S. Whitehead, Maryville, and Paul L. Goranson, Knoxville, all of Tenn., assignors to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 641,524, Dec. 17, 1975, Pat. No. 4,094,424.

This application May 19, 1977, Ser. No. 798,710

Int. Cl.[2] B65G *65/04*

U.S. Cl. 214—310 **3 Claims**

1. In the combination of a refuse container and refuse container unloading apparatus, the improvement comprising:

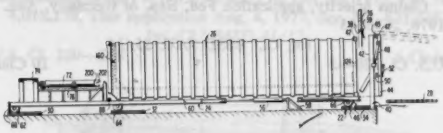
a tailgate pivotally connected on the container; tailgate lifting means carried by the container unloading appara-

tus, to engage and open the tailgate by rotating the tailgate, the tailgate lifting means having an opening for the advancement therethrough of the container tailgate;

a carriage movable horizontally between a container receiving position and a container discharge position, for supporting and moving the container to advance the container tailgate through the opening;

means to sense the carriage in the container discharge position; and

means to generate a signal in response to sensing the carriage in the container discharge position.

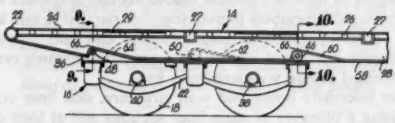


4,125,198

TRAILER HAVING SHIFTABLE UNDERCARRIAGE

Donald R. Landoll, Marysville, Kans., assignor to Landoll Corporation, Marysville, Kans.

Filed May 10, 1977, Ser. No. 795,640
Int. Cl.[2] B60P *1/04*
U.S. Cl. 214—506 **3 Claims**



1. A trailer including:

an elongate bed having a normally horizontal roading position;

a wheeled, bed-supporting undercarriage disposed adjacent the rear end of the bed therebelow when the bed is in said roading position,

said undercarriage being shiftable relative to the bed from said roading position to a bed-tilting position intermediate the ends of the latter;

apparatus interconnecting the bed and the undercarriage for shifting the latter;

mechanism coupled with the bed for tilting the latter when the undercarriage is in said bed-tilting position; and

structure for raising the bed to increase the distance between the latter and the undercarriage as the undercarriage is shifted from the roading position toward the bed-tilting position,

said bed being provided with a deck having supporting understructure,

parts of said understructure being at an elevation lower than the tops of the wheels of the undercarriage when the latter is in said roading position,

said structure raising said parts to a wheel-clearing position,

said understructure having a pair of laterally spaced, beams extending longitudinally of the bed, each provided with a tracking surface,

said undercarriage having a roller assembly engaging said surfaces during shifting of the undercarriage,

said structure including ramp means adjacent said rear end of the bed,

said ramp means including a front and a rear ramp along tracking surface respectively,

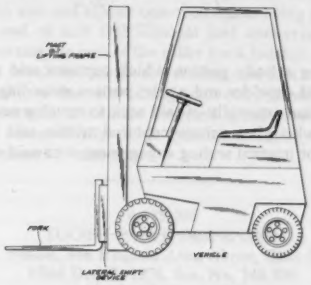
said roller assembly having a front and a rear roller for each ramp respectively.

4,125,199

LATERAL-SHIFT DEVICE FOR FORK-LIFT VEHICLES

Theodor Abels, Aschaffenburg-Nilkheim; Manfred Reissl, Radheim, and Willi Müller, Goldbach, all of Germany, assignors to Linde Aktiengesellschaft, Hoilriegelskreuth, Germany

Continuation of Ser. No. 638,157, Dec. 5, 1975, abandoned, which is a continuation of Ser. No. 459,048, Apr. 8, 1974, abandoned. This application Aug. 3, 1977, Ser. No. 821,475
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1973, 2317758; Jul. 18, 1973, 2336597; Aug. 3, 1973, 2339431
Int. Cl.[2] B66F *9/14*
U.S. Cl. 214—730 **3 Claims**



1. In a fork-lift vehicle having a lifting frame, a fork carrier vertically shiftable on said frame, and a fork member having a pair of forwardly-extending prongs mounted on said carrier, the improvement which comprises a lateral-displacement device on said carrier for displacing said member horizontally relative to said frame, said carrier comprising a flat horizontally-extending upper bar, a flat horizontally-extending lower bar spaced from and parallel to said upper bar, and vertical struts at opposite ends of said bars rigidly connecting them together, said bars and said struts framing a horizontally elongated window, said bars having forward and rearward facial planes, said device lying substantially completely between said planes and comprising a flat, rectangular section elongated body shorter than said window and disposed between said bars and spaced from said struts within said window, said body having a front face lying in said forward facial plane, said body being formed with a pair of oppositely-extending horizontally aligned cylinder bores each opening at a respective end of said body opposite a respective strut and terminating close to the center of said body, and a respective piston pin slidably received in each bore and bearing upon the respective strut upon fluid pressurization of the respective bore to displace said carrier horizontally, said body being mounted upon said frame, a linear array of ball bearings disposed between each of said bars and a respective side of said body for guiding said bars on said body, said upper bar being formed with a riding block complementarily engaging said rail and shiftable thereon, and pawl-and-notch means between said rail and said member enabling selective positioning of said member horizontally along said rail.

4,125,200

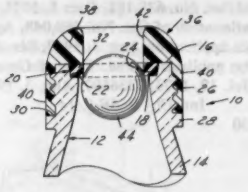
SELF-SEALING BOTTLE ASSEMBLY AND METHOD FOR MANUFACTURE THEREOF

Chester W. Manley, Pigeon, Mich., assignor to John Birka, Dearborn Hgts., Mich.

Filed Jan. 12, 1978, Ser. No. 868,923
Int. Cl.[2] B65D *39/06*
U.S. Cl. 215—246 **7 Claims**

1. A self-sealing bottle assembly comprising a glass bottle which includes an elongated hollow neck terminating in a bottle opening, first means forming a shoulder at said opening internally of said neck and second means forming a plurality of discontinuities on the external surface of said bottle neck ex-

tending around said external surface of said bottle neck extending around said external surface adjacent said opening; an annular resilient seal seated on said shoulder; a cap of thermosetting plastic material received by shrink fit onto said neck



and having a body portion which captures said seal firmly against said shoulder and a skirt portion extending from said body portion externally of said neck to envelop said discontinuities; and a glass sphere captured within said bottle and adapted for internal sealing engagement with said seal.

4,125,201

CLOSURE CAP

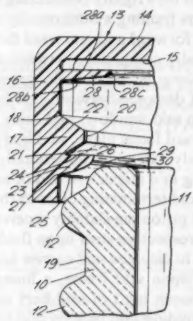
Ralph W. Birch, Rustington, England, assignor to U.M.P. Plastics Limited, Lancashire, England

Filed Nov. 9, 1977, Ser. No. 849,792

Claims priority, application United Kingdom, Nov. 25, 1976, 49226/76

Int. Cl.² B65D *41/04*

U.S. Cl. 215—330 **16 Claims**



1. A closure cap adapted to seal the neck of a container, the closure cap having a top portion and an annular skirt which extends from the periphery of the top portion, the skirt being provided internally with a skirt thread which is adapted to cooperate with an external neck thread on the neck of the container, the skirt also being provided internally with a radially extending resilient annular thread flange which is disposed immediately adjacent to and on the same helix as the skirt thread and is disposed on the side of the skirt thread facing the open end of the skirt, the thread flange, when undeformed, extending substantially radially inwardly of the skirt thread with a gap therebetween, the thread flange, when the closure cap is fully screwed onto the neck resiliently engaging the outer wall of the neck to effect centralisation and resist loosening of the closure cap, the thread flange being forced by the neck towards the skirt thread so as to reduce said gap.

4,125,202

PRESSURE VESSEL, ESPECIALLY FOR A NUCLEAR REACTOR CORE

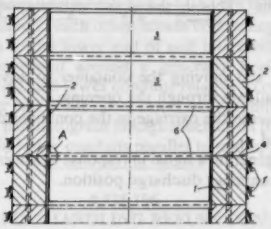
Franz Schilling, Kempen, Germany, assignor to Siempelkamp Giesserei GmbH & Co., Krefeld, Germany

Filed Aug. 12, 1977, Ser. No. 824,309

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1976, 2636743

Int. Cl.² B65D *7/02, 25/14*

U.S. Cl. 220—3 **10 Claims**



1. In a pressure vessel, especially for a nuclear reactor core, having a wall structure, the improvement wherein said wall structure comprises:

a plurality of annular cast members in stacked relatinship defining a cylindrical stack having at least one junction lying in a plane perpendicular to the axis of the stack;

a plurality of tension elements spaced around said stack and stressing the members thereof together parallel to said axis to resist separation of said members and said junction whereby, upon such separation, a pressure-releasing crack is formed in said wall structure; and

a liner internally lining said wall structure, said liner comprising a plurality of main liner sections and at least one junction-bridging liner section secured to said main liner sections and bridging said junction, said junction-bridging liner section comprising means that will cause rupture of said junction-bridging liner upon the development of a pressure within said vessel sufficient to separate said cast members at said junction.

4,125,203

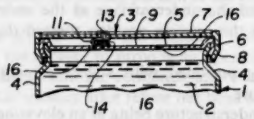
TWIST CAN TOP

Janos Sovari, and Geza J. Budai, both of P.O. Box 385, Tahoe City, Calif. 95730

Filed May 23, 1977, Ser. No. 799,870

Int. Cl.² B65D *51/22*

U.S. Cl. 220—258 **14 Claims**



1. A hermetic cylindrical container for carbonated beverages or the like of the type having a circular metal top with a tab scribed therein which may be torn back to provide a dispensing opening, the improvement comprising:

a circular lid enclosing the circular container top, for rotation between first and second positions, said lid having an aperture formed therein; and

means connecting said lid to the tab so that when said lid is rotated from said first position to said second position, the tab tears up and away into the space between the circular metal top and said circular lid to provide the dispensing opening, said second position characterized by alignment of the lid aperture with the dispensing opening.

4,125,204

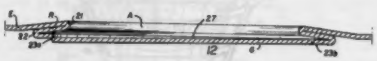
GATED CAN END WITH SHEAR OFFSET DEFINING GATE

Gerald B. Klein, 13451 Stuart Ct., Broomfield, Colo. 80020

Division of Ser. No. 774,596, Mar. 7, 1977, which is a continuation-in-part of Ser. No. 625,716, Oct. 24, 1975, Pat. No. 4,018,178. This application Aug. 4, 1977, Ser. No. 821,625

Int. Cl.[2] B65D *41/32*

U.S. Cl. 220—268 **4 Claims**



1. A can end having a push-down gate below an aperture in the lid, and being formed as a unitary structure by drawing and shaping the flat sheet metal member forming the can lid, and comprising:

(a) the aforesaid aperture in the lid member;

(b) a comparatively narrow spacing rim underfolded about the edge of this aperture to lie below the undersurface of the lid member;

(c) a panel portion connecting with the outward peripheral edge of the spacing rim to lie thereunder, and to extend across the aperture, below the lid and rim to normally close the gate; and

(d) a frangible discontinuity in the panel portion including the upper surface of the panel to define the outline of the aforesaid push-down gate, said frangible discontinuity being underneath the spacing rim and away from the edge of the aperture, whereby the exposed edge of the discontinuity formed when the gate is pushed downwardly to open the lid, will not be at the aperture, said frangible discontinuity comprising a replaced offset shear having sheared portions at both surfaces of the panel.

4,125,205

APPARATUSES FOR DISTRIBUTING HOT COOKED DISHES AND INSTALLATIONS EQUIPPED THEREWITH

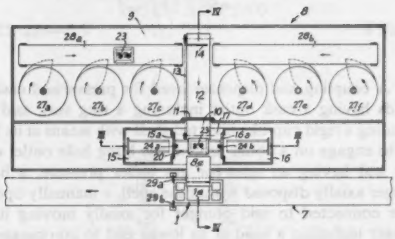
Marc A. Ambroise, Villa Monté Grosso - Montée du Mont d'Or, 13015 - Marseille, France

Filed Jan. 14, 1977, Ser. No. 759,544

Claims priority, application France, Jan. 16, 1976, 76 01928

Int. Cl.[2] A47J *27/14*; G07F *11/00*

U.S. Cl. 221—129 **13 Claims**



1. An apparatus for dispensing cooked dishes comprising, in combination:

a refrigerated isothermal cabinet in which cooked dishes are kept, said cabinet having an outlet opening for said dishes and automatic door means for selectively opening and closing said opening; a first conveyor located within the said cabinet and having one end emerging therefrom through said outlet opening;

and at least one microwave induction oven means for receiving the cooked dishes emerging from said cabinet and reheating them; said microwave oven means having an opening formed therein including motor driven sliding door means for selectively opening and closing said oven opening; a roller track located at right angles to said conveyor, said track being interrupted at the oven door, and having an extended roller track within the oven means; and a carriage which moves upon said roller track including an upper platform located on a level with said conveyor for receiving the cooked dishes emerging from the conveyor and transporting them into the oven; and outlet spout aligned with said conveyor and on a level with said carriage platform, said spout receiving and dispensing the hot dishes emerging from the oven and transported by the carriage; and a support arm oscillatably mounted about a horizontal axis parallel with said conveyor, and said at least one oven means being mounted on one end of said arm adjacent said conveyor, said arm supporting the part of the roller track located outside said oven means and means for causing said arm to rock periodically, so that said carriage moves by gravity upon said roller tracks; and means for opening and closing the oven door automatically and in synchronism with the rocking movements of said arm.

4,125,206

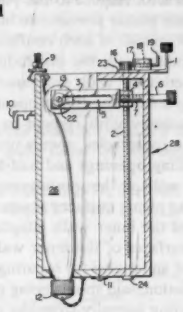
TOOTH PASTE DISPENSER

Bobby R. Wilson, 468 Iroquois Ave., Akron, Ohio 44305

Filed Dec. 9, 1976, Ser. No. 748,936

Int. Cl.[2] B65D *35/28*

U.S. Cl. 222—101 **1 Claim**



1. A dispensing device for dispensing the contents of a collapsible tube comprising:

(a) a plaque for mounting on a wall having at least one protruding slot for receiving a hook support;

(b) a container housing for a collapsible dispensing tube having at least one hook fixed to a side thereof adapted to engage said protruding slot for support on said plaque

(c) said container having front, back, and side walls, and top and bottom walls;

(d) said side, top and bottom walls forming two halves of said container and being hingedly connected for access thereto;

(e) flexible dispensing tube mounting and dispensing means provided in said container;

(f) said tube mounting means including spring clip means at the top of said container and aperture means in the bottom wall of said container;

(g) said dispensing means including a vertically mounted threaded drive rod driven by a sliding actuator engaging a gear fixed to said threaded drive rod, and a

(h) vertically movable carriage structure disposed in said container including a vertically threaded central opening threadedly receiving said drive rod, a roller engaging said vertically disposed tube, and roller bearing means adjustable by threaded screw means in a horizontal plane within slots in said carriage to vary the roller pressure against the tube.

4,125,207

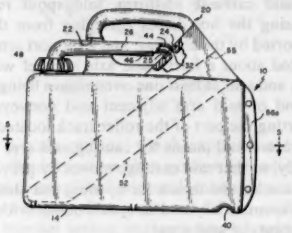
CHAIN SAW SERVICING KIT

Frederick T. Ernst, Thorndike Pond Rd., Jaffrey, N.H. 03452, and Frank Klay, Hingham, Mass., assignors to Frederick T. Ernst, Jaffrey, N.H.

Filed Feb. 28, 1977, Ser. No. 772,543

Int. Cl.[2] B67D *3/00*; B65D *25/46, 21/02*

U.S. Cl. 222—130 **8 Claims**



1. A container for transporting in separate compartments of different volume different materials comprising two entirely complete receptacles, each having outer side walls of identical configuration and inner side walls comprising planar portions adapted to be juxtaposed to provide a composite structure which is symmetrical with respect to the plane of said planar portions and within the planar portions an inner recessed wall and an inner protruding wall of such configuration that when the receptacles are juxtaposed, the protruding inner wall extends into the recessed inner wall, said outer wall of the two receptacles at the top containing filling openings adjacent one end situated symmetrically with respect to the plane of the planar portions of the receptacles, spouts pivotally connected at one end to said filling openings and half-handles integrally formed to the outer walls at the top intermediate the ends of the outer walls having planar surfaces situated in the planes of the planar surfaces of the inner walls adapted to meet in the plane of the planar surfaces of the inner walls to collectively define a whole handle and means for securing the two receptacles in juxtaposed relation, said spouts being pivotally movable from positions extending laterally from the container to positions parallel to the handle and said handle containing recesses for receiving and confining the distal ends of the spouts in a stored position at opposite sides of the handle.

4,125,208

APPARATUS FOR DEGASSING AND SUPPLYING PLASTIC MATERIAL TO PROCESSING MACHINES

Dieter Bettermann, Cologne, Fed. Rep. of Germany, assignor to SAPCO Systemanalyse und Projektberatung GmbH, Dusseldorf, Fed. Rep. of Germany

Filed May 27, 1977, Ser. No. 801,381

Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2623823

Int. Cl.[2] B29B *1/10*

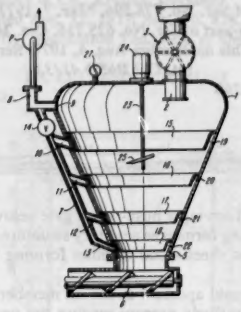
U.S. Cl. 222—152 **14 Claims**

1. An apparatus for supplying granular and pulverous plastic material selected from the group consisting of thermoplastics, duroplastics, rubber, and similar materials to a processing machine, particularly to an extruder, which comprises:

a charging hopper;

a plurality of vacuum connections arranged one above another-on said hopper and respectively having a mouth opening into said hopper; and

conduit means connected to said vacuum connections and connectable to a vacuum pump, the mouth of each successive vacuum connection having a diameter less than the



diameter of the mouth of the next higher vacuum connection.

4,125,209

COUPLING HEAD HAVING RESILIENT LINER FOR USE WITH PRESSURIZED CASKS

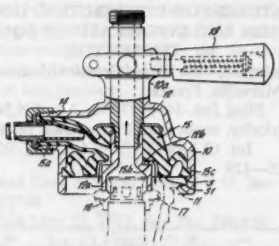
Victor S. Bailey, Teddington, England, assignor to Grundy (Teddington) Limited, Teddington, England

Filed Sep. 16, 1977, Ser. No. 834,822

Claims priority, application United Kingdom, Sep. 17, 1976, 38665/76

Int. Cl.[2] B65D *83/14*; F16L *37/18, 37/28*

U.S. Cl. 222—400.7 **5 Claims**

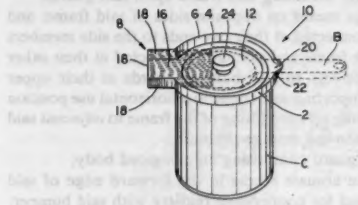


1. A coupling and dispenser head for pressurised casks for liquids having a cask outlet including a ring seal, said head including a rigid cup-like inverted shell with means at its lower end to engage on a collar around the bung hole outlet of the cask and having an inlet for gas under pressure, a hollow plunger axially disposed within the shell, a manually operated lever connected to said plunger for axially moving it, said plunger including a head at its lower end to co-operate with said ring seal at the cask outlet, whereby, with the coupling head engaged on the cask, when the plunger is moved down from its raised position the plunger depresses the ring seal to broach the cask, characterised by a resilient liner within the shell and through which the plunger passes, said liner having a duct therethrough leading from the gas inlet to the plunger surface and an inner surface part engaging on the plunger head when the plunger is in its raised position to seal the gas inlet and a lower portion to seat on and seal the cask outlet around the ring seal and wherein downward movement of the plunger causes its head to depress the ring seal and also to distort the liner thereby to break the gas seal around the plunger head so that gas pressure enters the cask around the ring seal.

4,125,210
ATTACHMENT FOR PAINT CANS

Milo J. Embree, Omaha, Nebr., assignor to Lawrence Peska Associates, Inc., New York, N.Y.

Filed Jul. 26, 1977, Ser. No. 819,110
Int. Cl.[2] B65D *25/40, 41/18, 51/18*
U.S. Cl. 222—570 **3 Claims**

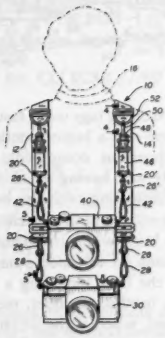


1. An attachment for paint cans, said attachment comprising an annular collar having attaching means on one side thereof for snap-fit engagement with the rim of a paint can, said collar on the side opposite said one side having an annular substantially flat surface and a wall portion upstanding therefrom, a brush rest portion extending laterally outwardly from said collar in a first direction and comprising an outward extension of said flat surface and said wall portion and shaped to receive a bristle portion of a paint brush, a spout portion extending from said collar in a second direction generally opposite from said first direction comprising an outward extension of said flat surface and said wall portion, said wall portion upstanding from said spout portion being inclined outwardly, and a cover member having an inwardly rounded edge engageable with an outwardly rounded interior portion of said collar and operable to close the opening therein by snap-fit engagement, said cover member being provided with handle means centrally thereof; the uppermost surface of said handle means and said wall portion of said brush rest portion and of said spout portion being in the same horizontal plane; and said brush rest portion, said handle means, and said spout portion being aligned to cooperatively receive a paint brush.

4,125,211
CAMERA SUPPORTING STRAP

Frederic B. Handsman, Bayside, N.Y., assignor to Ehrenreich Photo-Optical Industries, Inc., Garden City, N.Y.

Filed Oct. 13, 1976, Ser. No. 731,942
Int. Cl.[2] A45F *5/00*
U.S. Cl. 224—5 V **8 Claims**



1. A camera strap being adapted for supporting cameras in front of the body of a person wearing the strap, said strap including in combination two front portions of the strap extending downward and generally parallel to one another from the shoulders of the wearer and being generally flat against the wearer's body, detachable supporting means on each of the front generally parallel portions of the straps for supporting two cameras at a location between the straps and at different levels in front of the body, extensions of the front portions of the straps extending over the shoulders of the wearer and part way down the back of the wearer, and converging downwardly along the back of the wearer at an acute angle to one another to a vertex at a location intermediate the shoulders and waist of the wearer, and an elastic strap portion connected at its upper end with the extensions of the front portions at the intermediate location, means for anchoring the elastic strap portion to a belt or trouser band, the front portions of the strap being resistant to stretching under the weight of the cameras with which the strap is intended to be used, and the extensions of the front portions of the strap extending in directions to avoid contact with the back of the neck of a person wearing the strap, and the elastic strap portion holding the strap away from the wearer's neck but being stretchable to accommodate any forward bending of the body of the wearer, the detachable supporting means for an upper level camera extending downward and overlying the front surfaces of said generally parallel front portions of the strap the bottom ends of which are connected to the detachable supporting means for a lower level camera whereby the different level camera supporting means accommodate cameras of equal width, said detachable supporting means for an upper level camera being adjustable up and down along the front portions of the strap to regulate the difference in the levels of the cameras, and non-swivel connectors at the lower ends of said supporting means to hold the cameras facing forward and to prevent each camera from rolling about a horizontal axis.

4,125,212
PORTABLE UTILITY BAG

Luc Courchesne, 3492 Laval St., Montreal, Quebec, Canada (H2X 3C8)

Filed Mar. 3, 1977, Ser. No. 774,054
Int. Cl.[2] A45F *3/02, 3/04*
U.S. Cl. 224—9 **3 Claims**

1. A portable utility bag having an upper end and a lower end and comprising a flexible envelope having opposite walls cooperatively defining a common and closed peripheral edge all around said envelope, said common and closed peripheral edge including a first straight common edge portion at said lower end of the bag and a second straight common edge portion at the upper end of said bag, a stiffening band fixedly secured to said envelope and extending lengthwise along said first straight common edge portion, a pair of loops fixed to said envelope and projecting from said second straight common edge portion and spaced apart along said second straight common edge portion, a pair of tying bands secured to said envelope, projecting endwise from the latter and from the opposite ends respectively of said stiffening band, operatively engageable in said loops respectively and adapted to be tied one to the other intermediate said loops to thereby define tying band portions extending from the ends of the stiffening band to said loops and second tying band portion extending between the two loops, said tying bands forming at the upper end of said bag a carrying handle or a single shoulder strap intermediate said loops or a pair of shoulder straps longitudinally extending

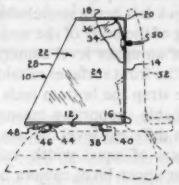
between said stifening band and said loops, one of said walls having a slit forming an access opening for the envelope and a closure for said slit, the lower end portion of said bag being rollable around said stiffening band to decrease the effective volume of the bag and keep the contents of the bag in tight condition, said tying bands, when exerting an upward pull on the said stiffening band, keep the latter flat against the bottom and contents of the bag thereby preventing unrolling of the lower end portion of said bag.

4,125,213

COLLAPSIBLE LUGGAGE FOR MOTORCYCLE

Julian W. Watkins, 222 Hendricks, Michigan City, Ind. 46360

Filed Feb. 6, 1978, Ser. No. 875,585
Int. Cl.[2] B62J *9/00*
U.S. Cl. 224—31 **4 Claims**



1. A collapsible luggage for a motorcycle provided with a luggage rack and back rest, comprising:

a rectangular shaped substantially rigid base panel;

a trapezoidal shaped substantially rigid upright panel hingedly connected to said base panel;

a rectangular shaped substantially rigid top panel hingedly connected to the top edge of said upright panel, the width dimension of the top panel being less than the width dimension of said base panel and the length dimension of said top panel being less than the height dimension of said upright panel;

a flexible sheet material connecting said panels forming the other three walls of said luggage;

an opening in said flexible sheet forming one of the walls of said luggage;

clamp means on the bottom side of said base panel for releasably engaging said luggage rack; and

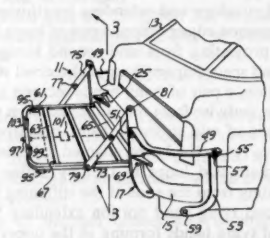
strap means anchored to said upright panel for releasable connection to said motorcycle seat back rest serving to brace said luggage against said back rest when said luggage is mounted on said luggage rack, and serving as a handle for carrying said luggage when said luggage is removed from said rack.

4,125,214

BUMPER GUARD-LUGGAGE CARRIER

Silas Penn, 5316 Sheridan Ave., Detroit, Mich. 48213

Filed Sep. 6, 1977, Ser. No. 830,956
Int. Cl.[2] B60R *9/06*
U.S. Cl. 224—42.08 **9 Claims**



1. A luggage carrier for a vehicle having a body and a rear bumper, a pair of upright laterally spaced bumper guards bearing against and secured to said bumper transversely thereof and extending above and below said bumper;

a U-shaped rack frame having side members and a series of parallel spaced cross bars;

one end of said frame bearing against and interposed between said guards;

means pivotally mounting said frame upon said guards;

pivotal linkage means on opposite sides of said frame; and pivotally connected at their one ends to the side members of said rack frame and pivotally connected at their other ends respectively to said bumper guards at their upper ends; for supporting said frame in a horizontal use position and permitting upward tilting of the frame to adjacent said body to a non-use storage position;

each bumper guard comprising an elongated body;

there being an arcuate recess in the forward edge of said body adapted for cooperative registry with said bumper;

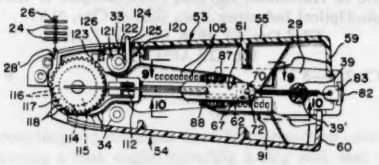
means securing said body to said bumper; a pair of arcuate horizontal stabilizers, each stabilizer at one end secured to one bumper guard, with its other end extending above said bumper; and an arcuate vertical stabilizer at one end secured to each horizontal stabilizer respectively, with its other end extending rearwardly and secured to said bumper.

4,125,215

TAG ATTACHING APPARATUS

William A. Jenkins, Englewood, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 685,244, May 11, 1976, Pat. No. 4,049,176.
This application Jul. 25, 1977, Ser. No. 818,780
The portion of the term of this patent subsequent to Sep. 20, 1994, has been disclaimed.
Int. Cl.[2] B25C *1/00*
U.S. Cl. 227—67 **8 Claims**

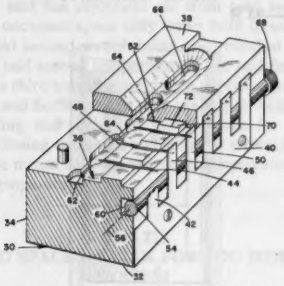


1. Apparatus for attaching tags using fasteners, each fastener including a bar section and a button section joined by a filament section, the apparatus comprising: a body, a needle mounted by the body and having an elongated bore and an elongated slot communicating with the bore, a push rod engageable with the bar section of the fastener for driving the bar section through the bore while its filament section extends through the slot, means for advancing one fastener at a time into alignment with the bore including a toothed member, a pawl for driving the toothed member, means for driving the push rod and the pawl, wherein the driving means includes a slide and includes a carrier connected to the push rod and movably mounted on and relative to the slide, the body including guideway means, the slide including means received in the guideway means for guiding the slide, and means coupling the slide and the carrier for relative movement with respect to each other.

4,125,216
APPARATUS FOR ACCOMPLISHING SOLDER BONDING

Stephen Ozimec, 33391 Padina Cir., Laguna Niguel, Calif. 92677

Filed Jan. 5, 1977, Ser. No. 757,067
Int. Cl.[2] B23K *37/04*
U.S. Cl. 228—4.5 13 Claims



1. Apparatus for use in bonding conductors to connection points on electrical elements, comprising in combination:

a. conductor holding means in the form of a member formed with cutouts in which a conductor may be held;

b. conductor retaining means capable of overlying said conductor holding means for retaining said conductor in said cutouts while permitting longitudinal movement thereof relative to said conductor holding means;

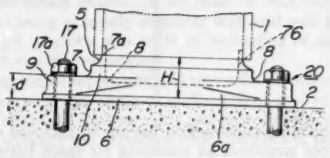
c. element holding means for holding an electrical element having a connection point such that said connection point lies in the path of longitudinal movement of a conductor being retained in said holding means; and

d. urging means for urging a conductor being retained in said holding means to move longitudinally relative to said conductor holding means such that an end portion of the conductor is in engagement with said connection point of the element.

4,125,217
METHOD OF CONNECTING HOLLOW STEEL COLUMN TO A HOLLOW STEEL BASE MEMBER

Kuniaki Sato, Hiratsuka, Japan, assignor to Kajima Corporation, Tokyo, Japan

Division of Ser. No. 613,547, Sep. 15, 1975, Pat. No. 4,070,837, which is a continuation-in-part of Ser. No. 385,166, Aug. 2, 1973, Pat. No. 4,048,776. This application Dec. 15, 1976, Ser. No. 750,868
Claims priority, application Japan, Aug. 21, 1972, 47-82799; Aug. 21, 1972, 47-82800
Int. Cl.[2] B23K *31/02*
U.S. Cl. 228—169 6 Claims



1. In a method of connecting a hollow steel column member to a base plate member, the method including the steps of:

integrally forming an upwardly extending projection with a planar bottom plate portion;

providing the projection with a top surface having a residual portion, the outer peripheral edges of said residual portion defining an area whose cross-sectional shape and size are substantially identical to that of an area defined by the inner peripheral walls of the lower end of the steel column member; and

forming J-shaped welding grooves along the outer peripheral edges of said residual portion, said J-shaped grooves facing the lower end of the steel column member;

the improvement which comprises the steps of:

placing at least one strap in opposition to and in direct contact with said residual portion of the top surface formed with said J-shaped grooves, for determining the axial position of the steel column member relative to the base plate member;

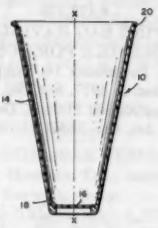
connecting by welding the strap to an inner peripheral wall of the lower end of the steel column member, positioning the lower end of the steel column member onto the top surface of said base plate member, adjacent to the outer peripheral edges of said residual portion and in a desired relation to said J-shaped grooves; and

effecting J-shaped groove welding along said J-shaped grooves between the lower end of the steel column member and the top surface of said base plate member.

4,125,218
MEGAPHONE-CUP

Paul A. DeBoer, 34 Crestwood Rd., Marblehead, Mass. 01945

Filed Nov. 23, 1977, Ser. No. 854,137
Int. Cl.[2] B65D *1/00*
U.S. Cl. 229—1.5 B 4 Claims



1. A hollow frustoconical structure of circular right section with respect to its longitudinal axis, said structure having ends which are defined by rounded edges concentric with said longitudinal axis and which lie in planes perpendicular to said axis, such as to enable standing the structure upright on the smaller end in stable equilibrium and a closure member at the smaller end situated inwardly from the rounded edge forming a bottom for the structure to enable using the structure as a receptacle when set down upon its smaller end, means detachably connecting the bottom to the wall of the structure inwardly of said rounded edge to enable removing the bottom so that the structure may be used for a megaphone and said smaller end of the structure being consistent in diameter with the diameter of the mouthpiece of a conventional megaphone.

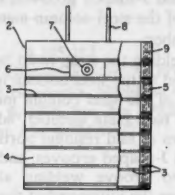
4,125,219
BAG FOR VACUUM CLEANERS

Anders Engen, Dragonveien 40, 1362 Billingstad, Norway

Filed Jul. 15, 1977, Ser. No. 816,013
Claims priority, application Norway, Jul. 16, 1976, 762495
Int. Cl.[2] B65D *31/12*
U.S. Cl. 229—53 6 Claims

1. A disposable dust-collecting bag for use in a vacuum cleaner, which at its upper part is provided with an opening for suction of dust-laden air into the bag which has walls comprising several layers of non-woven cellulosic material with an outer wrapper of non-woven cellulosic material, the layers of non-woven cellulosic material and the outer wrapper of non-woven cellulosic material being joined together by means of separate lines of an adhesive extending transversely of the bag, characterized in that bag walls have an inner and outer coher-

ent layer of non-woven fibrous web respectively and between the inner and outer layer have several layers of separate strips (1) of non-woven fibrous web laid in parallel relationship in each layer and so that the strips of non-woven fibrous web in one layer are laterally displaced with regard to the strips of non-woven fibrous web in the adjacent layer in an overlapping relationship, the strips of non-woven fibrous web extending



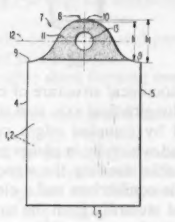
from the top of one bag wall around the bottom of the bag and up to the top of the other bag wall, and the separate transverse lines (3) of an adhesive penetrating the outer layer of non-woven fibrous web, the intermediate layers of strips of non-woven fibrous web and the layer of non-woven fibrous web inside the bag, whereby the bag walls are built up of transverse and parallel dust-collecting sections (4).

4,125,220

PLASTIC SHOPPING BAG HAVING A REINFORCED HANDLE PORTION

Heikki S. Suominen, Petsamonk 14, Tampere, Finland

Filed Dec. 2, 1977, Ser. No. 856,871
Claims priority, application Finland, Dec. 3, 1976, 763481
Int. Cl.[2] B65D *33/08*
U.S. Cl. 229—54 R **7 Claims**



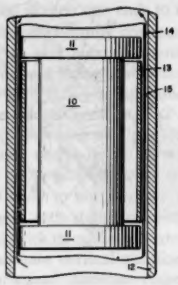
1. A plastic shopping bag comprising a pair of opposing bag faces fabricated of plastic film material joined to one another to form a closed bottom edge for said bag, a pair of closed side edges spaced from one another and extending transversely to said bottom edge, and an open mouth located between said side edges in spaced relation to said bottom edge, each of said faces defining a handle portion for said bag adjacent said open mouth, the handle portion on each of said faces comprising an integral portion of said face shaped in a wave configuration symmetrical about a center line disposed substantially equidistant between said side edges of said bag with the lowest points of said wave configuration being located adjacent the side edges of said bag and the highest point of said wave configuration being located substantially on said center line, the handle portion on each of said faces including a strip of plastic material which is of heavier gauge than the faces of said bag, said heavier gauge strip extending across said handle portion in a direction generally parallel to said bottom edge of said bag, said heavier gauge strip including a lower boundary edge which intersects said wave configuration at locations between said lowest and highest points of said wave configuration that are spaced inwardly of the side edges of said bag.

4,125,221

TEMPERATURE-DEPENDENT LIQUID METAL FLOWRATE CONTROL DEVICE

Roger D. Carlson, LaGrange, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 7, 1977, Ser. No. 831,193
Int. Cl.[2] G05D *23/26*
U.S. Cl. 236—93 R **7 Claims**



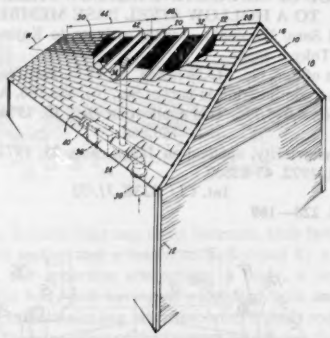
1. A temperature-dependent liquid metal flow rate control device comprising a magnet and a member formed of a curie material having a curie temperature at which a change in the flow rate of the liquid metal is desired, said magnet and curie material being spaced to establish therebetween a flow path for liquid metal whereby flow of liquid metal along the flow path is impeded at temperatures at which the liquid metal flows through a large magnetic flux and flow impedance is reduced at temperatures at which magnetic lines of force are shunted away from the liquid metal flow path.

4,125,222

SOLAR HEAT AUGMENTED HEATING SYSTEM AND TEMPERATURE RESPONSIVE GABLE VENT

Harry H. Briscoe, Rte. 10, Burnett Ferry Rd., Rome, Ga. 30161

Filed Dec. 20, 1976, Ser. No. 752,565
Int. Cl.[2] F24J *3/02*; F24D *12/00*
U.S. Cl. 237—1 A **14 Claims**



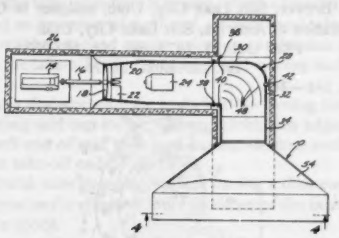
1. In a building construction having an enclosed occupant space, a roof structure, an insulating air space between said occupant space and said roof structure, and vent means connecting said insulating air space with ambient atmosphere to prevent the attainment of such temperatures within the insulating air space as may damage said roof structure, the improvement which comprises: vent closure means for selectively opening and closing said vent means, actuator means connected to said vent closure means for causing the vent means to be closed when the temperature in said insulating air space falls below a first temperature and for causing said vent means to be

opened when the temperature in said insulating air space rises above a second temperature which is higher than said first temperature, a fan having an inlet communicating with said insulating air space and an outlet communicating with said occupant space, a first switch thermostatically controlled by the temperature in said occupant space and a second switch thermostatically controlled by the temperature in said insulating air space, said switches being connected in series with said fan whereby said fan circulates air from said insulating air space to said occupant space only when both of said switches are closed, said second switch being controlled at a temperature less than said second temperature while said first switch is controlled at a third temperature which is a conventional room temperature, said fan forming a part of a hot air heating system for the building and including valve means for selectively opening and closing said inlet, and actuator means for controlling said valve means to close same at a tempterature less than said second temperature.

4,125,223
AIR FIELD SPACE HEATER FOR FOG DISPERSAL SYSTEM

George P. Carver, Newport Beach; Frank C. Price, Jr., Santa Ana, and Thomas J. Tyson, Turtle Rock, all of Calif., assignors to Ultrasystems, Inc., Irvine, Calif.

Filed Apr. 18, 1977, Ser. No. 788,558
Int. Cl.[2] E01H *13/00*
U.S. Cl. 239—14 11 Claims



1. In a fog dispersal system for an aircraft runway or the like, wherein said system includes a plurality of burners for generating heated air, an improved air field space heater means for directing heated air jets at various angles of inclination relative to the plane of the runway, said heater means comprising:

a walled pit recessed below the level of said runway, a wall portion of said pit rising at a shallow angle relative to the plane of said runway;

duct means in fluid communication with a burner for receiving heated air;

an elbow in said pit in fluid communication with said duct means and having an outlet, said elbow being operative to receive heated air from said duct means and project a jet of said heated air from said outlet at a predetermined angle of inclination relative to the plane of said runway, said outlet being generally alignable with said wall portion of said pit whereby said angle of inclination of said jet is a relatively shallow angle;

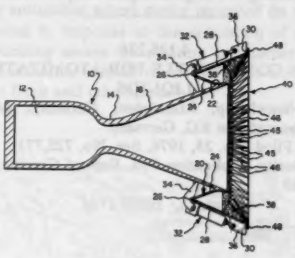
coupling means supporting said elbow for pivotal movement for varying said angle of inclination of said jet between said relatively shallow angle and higher angles of inclination whereby the dispersion characteristics of said jet may be varied; and

a splitter plate spaced from and arranged substantially parallel to said wall portion, the outer extremity of said splitter plate extending at least to ground level, the inner extremity of said splitter plate being adjacent said elbow upon said alignment of the bottom of said outlet of said elbow and said sloped wall portion whereby said splitter plate tends to reduce dispersion of said jet upwardly of said pit during said alignment.

4,125,224
EXTENDIBLE/EXPANDABLE NOZZLE FOR ROCKET ENGINES AND THE LIKE

Lee F. Carey, North Tonawanda, N.Y., assignor to Textron, Inc., Providence, R.I.

Division of Ser. No. 637,405, Dec. 3, 1975, abandoned. This application Jun. 24, 1977, Ser. No. 809,550
Int. Cl.[2] B64C *15/06*
U.S. Cl. 239—265.43 6 Claims

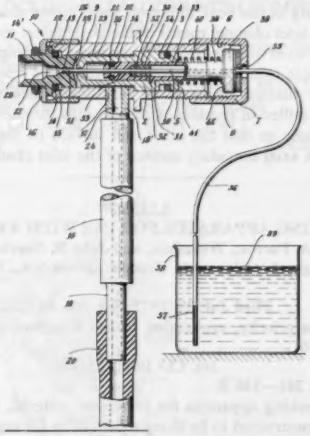


1. A folded rocket engine skirt for attachment to a rocket engine nozzle, said skirt comprising a frusto-conical piece of ductile material adapted to assume an unfolded frusto-conical shape, said piece of ductile material having been plastically deformed and pleat-folded along a plurality of crease lines to a radially and axially contracted configuration relative to the maximum radial and axial dimensions of said unfolded frusto-conical shape wherein said folded skirt is adapted to assume a generally flat annular form.

4,125,225
CORROSION-FREE NEBULIZER

Alexis A. Venghiattis, Houston, Tex., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of Ser. No. 122,570, Mar. 1, 1971, abandoned. This application Nov. 24, 1975, Ser. No. 634,587
Int. Cl.[2] B05B *7/30*
U.S. Cl. 239—338 4 Claims



1. In a nebulizer for forming a fine spray or mist from an originally liquid (sample) solution of the type including means for forming a venturi restriction including a narrow venturi throat through which a gas travels at accelerated velocity, and a nebulizing tube of substantially capillary size positioned with its tip within the narrow venturi throat, through which tube the sample solution is introduced and caused to nebulize into a

fine mist at its tip by means of the high velocity gas flow through the narrow venturi throat in the vicinity of said tip so as to form a mixture of fine liquid mist and gas, the improvement comprising:

said liquid nebulizing tube being in the form of a flexible monolithic corrosion-resistant artificial resin tubing, one end of which forms said nebulizing tip of said tube, while the other remote end is directly introduced into a container holding the original liquid sample solution.

4,125,226

HOLLOW CONE NOZZLE FOR ATOMIZATION OF LIQUIDS

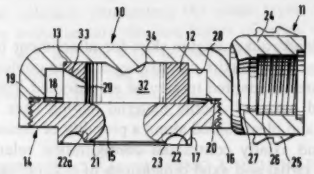
Wolfgang Nieuwkamp, Metzingen, Germany, assignor to Lechler Apparatebau KG, Germany

Filed Sep. 23, 1976, Ser. No. 725,771

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1975, 2542240

Int. Cl.[2] B05B *1/34*

U.S. Cl. 239—468 **39 Claims**



1. A hollow cone nozzle for atomizing liquids, comprising a housing means provided with a substantially tangential inlet means and a mouthpiece containing a nozzle discharge and operable to be detachably secured in the housing means, characterized in that a ring-shaped swirl insert means is arranged in the nozzle housing means having a central opening disposed substantially coaxial to the nozzle discharge and being provided with several inlet channel means directed substantially transversely to the axis of the opening, and in that the inlet channel means of the swirl insert means have a cross section decreasing in the flow direction, and further characterized in that the inlet channel means of the swirl insert means are constructed so as to terminate at least essentially tangentially from the outside into the substantially cylindrical opening, in that the inlet channel means of the swirl insert means are groove-shaped, milled-in recesses with openings directed toward the mouthpiece so that the inner end surface of the mouthpiece forms an axial boundary surface of the inlet channel means.

4,125,227

BREAKING APPARATUS FOR USE WITH A CONVEYOR

George A. Parrott, Wakefield, and John B. Norris, Leeds, both of England, assignors to Dresser Europe S.A., Brussels, Belgium

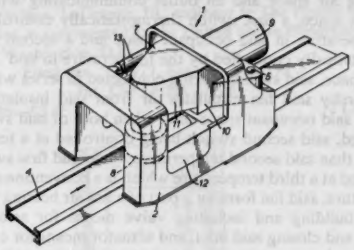
Filed Jul. 20, 1977, Ser. No. 817,212

Claims priority, application United Kingdom, Jul. 22, 1976, 30682/76

Int. Cl.[2] B02C *13/286*

U.S. Cl. 241—186 R **12 Claims**

1. Breaking apparatus for conveyed material, comprising a frame constructed to lie along a path of or for conveyed material, a rotary breaking element drivably carried by the said frame for rotation about a generally vertically extending axis, and non-driven reaction means on the said frame against which material may be impacted, the reaction means being spaced laterally, with respect to the direction in which the path extends, from an adjacent periphery of the rotary element so as to lie laterally adjacent the path and extend generally upwardly to define between the rotary element and the reaction means a material breaking gap, whereby, in use of the apparatus, material on the path entering the material breaking gap is broken by



a generally sideways breaking action against the reaction means by the rotary element as the latter rotates.

4,125,228

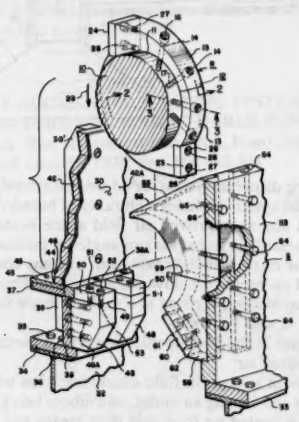
SHREDDER AND IMPROVEMENTS THEREIN

John C. Brewer, Salt Lake City, Utah, assignor to Garbalizer Corporation of America, Salt Lake City, Utah

Filed Oct. 17, 1977, Ser. No. 842,957

Int. Cl.[2] B02C *18/16*

U.S. Cl. 241—243 **6 Claims**



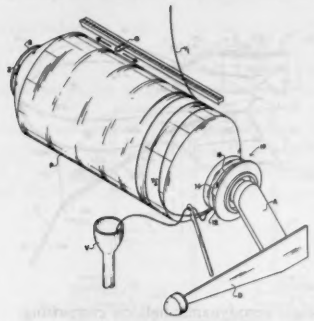
1. In a shredder having a feed opening, an axially revolvable rotor comprising a shaft provided with a series of mutually spaced blade means, and fixed structure cooperatively disposed with respect to said rotor: an improvement wherein said fixed structure includes a rigidly supported horizontal base plate, a horizontally elongate, upright support having a series of upright grooves and transverse apertures contiguous with said grooves, the spacing between said grooves being essentially, respectively aligned with said blade means of said rotor, a plurality of upstanding blocks resting on and supported by said base plate and positioned in said grooves of said upright support, said upstanding blocks having apertures mutually registering with said transverse apertures of said upright support, and plural attachment means passing through said registering apertures for releasably securing said upstanding blocks at said apertures thereof to said upright support.

4,125,229

APPARATUS FOR RESTARTING A BROKEN THREAD OR YARN STRAND DURING A WINDING PROCESS

Roy E. Dillon, Stoneville, N.C., assignor to Macfield Texturing, Madison, N.C.

Filed Nov. 15, 1977, Ser. No. 851,697
Int. Cl.[2] B65H *54/02*
U.S. Cl. 242—18 R **3 Claims**



1. In a thread or yarn processing apparatus of the type including a take-up mechanism with a cylindrical, yarn receiving tube, wherein the tube includes a base end where a transfer tail is secured, and an opposite take-off end, an improved take-off end cap removably attached to the winding mechanism and engageable to the take-off end of the spool, said end cap including:

(a) a generally disc-shaped main body portion having means for attaching said cap to the take-up mechanism adjacent the take-off end of said tube, and having an inner surface facing the take-off end of the tube;

(b) a cylindrical, tube engaging surface having a diameter at least as great as the effective inner diameter of the take-off end of the spool;

(c) a flange extending radially from said body portion and having a diameter greater than the diameter of said tube engaging surface and greater than the outer diameter of the tube;

(d) an annular shoulder portion connecting said flange and said tube engaging surface, said shoulder having a diameter greater than that of the tube engaging surface, smaller than the outer diameter of the take-off end of the tube, and smaller than the diameter of said flange, such that when the tube is emplaced on the cap, said shoulder forms a recess between the tube end and said flange; and

(e) yarn pick-up means associated with said flange such that during the take-up process a yarn positioned adjacent said flange will be picked up and caused to be wrapped around said shoulder portion to form a trailing end from the yarn supply which is tied off at a later time.

4,125,230

GOLF BALL RETRIEVAL APPARATUS

George J. Fischer, 2178 N. Jerusalem Rd., North Bellmore, N.Y. 11710

Filed May 25, 1977, Ser. No. 800,359
Int. Cl.[2] A63B *69/36*
U.S. Cl. 242—54 R **22 Claims**

1. Retrieval apparatus for a ball comprising:

a tether for connection to said ball;

a base;

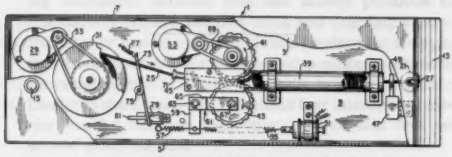
a take-up reel for said tether, a selectively actuatable reel motor for said tether and adapted to draw a ball, connected by the tether to said reel, toward said base;

reel motor switching means connected to said reel motor for automatically deactivating said motor in response to the drawing of said ball to a pre-selected position relative to said base;

first and second rotatable tether drive wheels mounted on the base;

shifting means coupled to at least one of the tether drive wheels and responsive to the activation of said reel motor switching means for decreasing the distance between said tether drive wheels whereby said wheels frictionally engage said tether;

a selectively actuatable wheel motor mounted on said base and activated in response to the activation of said reel motor switching means for rotating said tether wheels, whereby said tether wheels remove at least a portion of said tether from said take-up reel;



an elongated tubular member having openings at both ends thereof coupled to said base;

guide means located between said tubular member and said tether drive wheels, at least a portion of said guide means extending through one of said tubular end openings and being located within said tubular member, said tubular member receiving at least a portion of the tether removed from said take-up reel and maintaining said tether in a slack condition; and

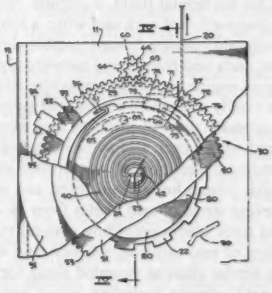
wheel motor switching means coupled to said wheel motor for deactivating the wheel motor in response to the removal of a pre-selected length of tether from the take-up reel.

4,125,231

EMERGENCY LOCKING RETRACTOR WITH COMFORT BELT TENSION

Cyril Henderson, Valencia, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Continuation-in-part of Ser. No. 714,395, Aug. 16, 1976. This application Feb. 28, 1977, Ser. No. 772,649
Int. Cl.[2] A62B *35/00*; B65H *75/48*
U.S. Cl. 242—107 **16 Claims**



1. In a safety belt retractor having a belt storage spool and a spool rewind spring for biasing said spool in a belt rewind direction, the improvement in means for reducing the tension applied to the belt when in use relative to the normal bias of said rewind spring, comprising the provision of:

means for providing a reduced rewind bias on said spool to provide a reduced tension on said belt;

means for activating said means for providing a reduced rewind bias in response to spool rotation in a predetermined manner and

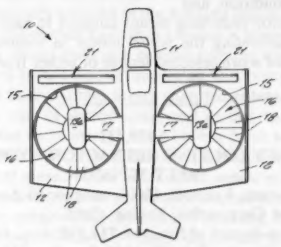
means for deactivating said means for providing a reduced rewind bias in response to spool rotation in a belt rewind direction of more than one full revolution under the influence of said reduced tension which is unrelated to the amount of belt unwound from said spool beyond an initial unwinding of an amount at least equal to said spool rotation in a belt rewind direction.

4,125,232

VERTICAL TAKE-OFF AND LANDING (VTOL) AIRCRAFT WITH FIXED HORIZONTAL VARIABLE-PITCHED ROTORS

Ewen M. MacLean, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of, New York, N.Y. 10007

Filed Nov. 2, 1976, Ser. No. 738,021
Int. Cl.[2] B64C *29/00*
U.S. Cl. 244—12.3 **2 Claims**



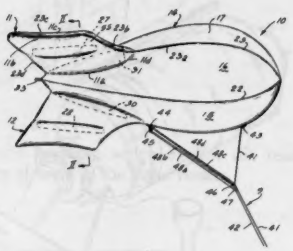
1. In a vertical take-off and landing aircraft, the combination of a jet airplane including a fuselage and sideward wings, a turbojet engine for horizontal flight, a circular opening vertically through a midportion of each said wing, a rotor assembly positioned in each said opening being rotatable about a generally vertical axis, each said rotor being individually controlled and powered by an engine, including transverse struts supporting said engines axially above said rotors, said struts extending laterally from opposite sides of said fuselage parallel to and spaced above said wings, each said rotor including a plurality of radially extending blades pivotally controlled about a radially extending axis from a hub of said rotor, and means being provided to prevent stress of said blades from air during forward flight, said rotor blades providing vertical thrust during takeoff or landing of said airplane, wherein said means comprise transverse similar ailerons mounted along forward edges of each wing, said ailerons including upper and lower fins pivotally controlled about hinges along their forward edges hinged to upper and lower surfaces of said wing, said ailerons being of such length so as to deflect air from contact with the entire rotor assembly having a closed streamlined front edge diverging rearwardly to align with upper and lower surfaces of the wings.

4,125,233

TETHERED AERODYNAMIC BALLOON WITH INTEGRAL FINS

James A. Winker, Sioux Falls, and Kenneth L. Tekrony, Brandon, both of S. Dak., assignors to Raven Industries, Inc., Sioux Falls, S. Dak.

Filed May 4, 1977, Ser. No. 793,486
Int. Cl.[2] B64B *1/42*
U.S. Cl. 244—33 **8 Claims**



1. A non-rigid aerodynamic balloon comprising:

an elongate tubular aerodynamic shaped body with a rounded nose at one end and a tail at the other end;

a plurality of inflatable stabilizing fins projecting radially from the tail end with body portions of the balloon between said fins;

said body and tail fins made of a lightweight skin material formed in gores seamed to each other by longitudinal seams running the full length of the body;

said seams including intermediate seams extending between said tail fins in said body portion and including tail seams extending linearly along the body and continuing along the outermost edge of the tail fins;

each side of said fins being of one continuous gore of said material extending linearly for the length of the balloon and extending radially for the full fin and extending continuously from said tail seam to said intermediate seam so that the base of the fin joins the body portion in curved merging portions;

and fin support members extending across within the fins limiting separation of gores at opposite sides of the fins.

4,125,234

EMERGENCY CIRCULATING SYSTEM FOR AN AIRCRAFT HYDRAULIC BRAKE SYSTEM

George W. Tregre, 2325 Queen, Ft. Worth, Tex. 76103

Division of Ser. No. 772,816, Feb. 28, 1977, abandoned. This application Jan. 30, 1978, Ser. No. 873,113
Int. Cl.[2] B64C *25/42*
U.S. Cl. 244—111 **4 Claims**

1. An aircraft hydraulic brake system having an emergency fluid circulating system for maintaining a supply of fluid in the fluid lines should a leak occur, comprising:

a first master cylinder;

a first wheel cylinder connected to a first wheel brake on one side of the aircraft;

a first fluid line extending directly between the first wheel cylinder and the first master cylinder;

a first brake pedal connected to the first master cylinder;

a second master cylinder;

a second wheel cylinder connected to a second wheel brake on the side of the aircraft opposite the first wheel brake;

a second fluid line extending directly between the second wheel cylinder and the second master cylinder;

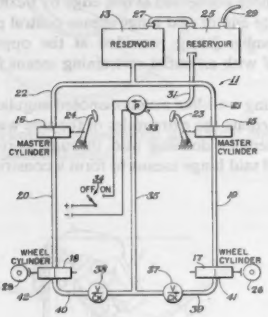
a second brake pedal connected to the second master cylinder;

a reservoir connected to the master cylinders for supplying fluid to them;

an electrically driven hydraulic pump connected to the reservoir;

a third fluid line connected to the output of the pump and leading to the bleedoff ports of each of the wheel cylinders; and

valve means in the third fluid line for allowing flow from the pump to each of the wheel cylinders, but preventing flow in the opposite direction, thereby allowing fluid to be pumped by the pump directly from the reservoir to the



wheel cylinders and thence through the first and second fluid lines to the master cylinders to maintain a supply of fluid in the wheel cylinders and first and second fluid lines should a leak occur therein;

the pressure exerted by the pump being insufficient to actuate the first and second wheel cylinders to cause braking;

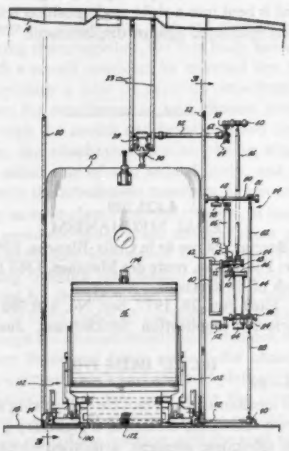
the pressure exerted by the master cylinders being sufficient to overcome the pump flow and close the valve means for braking.

4,125,235

APPARATUS FOR OPENING AN AIRCRAFT DOOR AND FOR ARMING AND DISARMING AN ESCAPE SLIDE DEPLOYING MECHANISM

James T. Fitzgerald, Mercer Island, and Burton Bergman, Kent, both of Wash., assignors to The Boeing Company, Seattle, Wash. and Aeritalia S.p.A., Naples, Italy

Filed Apr. 4, 1977, Ser. No. 784,568
Int. Cl.[2] B67C *1/14*
U.S. Cl. 244—129.5 **16 Claims**



1. In a door system for an aircraft including a fuselage having a door opening, a floor adjacent the bottom of said door opening, a door and means mounting the door for upward and downward movement between a closed position and an open position, locking means for holding said door in said closed position, an escape slide container normally attached to said door and coupling means for releasing said container from said door and for attaching said container to said floor for deployment through said door opening, improved actuating mechanism for closing and opening said door and for arming and disarming said coupling means comprising:

a first interior handle mounted on said fuselage for swinging movement between a first and second position, said first handle operably associated with said locking means to respectively lock and unlock said door upon movement of said first handle between said first and second positions,

a second interior handle mounted on said fuselage for swinging movement between first and second positions for respectively arming and disarming said coupling means,

a first exterior handle mounted on said fuselage for swinging movement between first and second positions, and means for coupling said first exterior handle to said first interior handle to simultaneously move said first interior and exterior handles between respective ones of said first and second positions, and

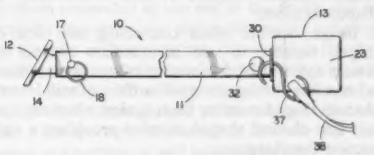
a second exterior handle mounted on said fuselage for swinging movement between first and second positions, and means coupling said second exterior handle with said second interior handle to simultaneously move said second handles between respective ones of said first and second positions.

4,125,236

TRANSOM SAVER

Joseph E. Landwerlen, 728 1st St., Shelbyville, Ind. 46176

Filed May 11, 1977, Ser. No. 795,792
Int. Cl.[2] B63H *5/12*
U.S. Cl. 248—4 **4 Claims**



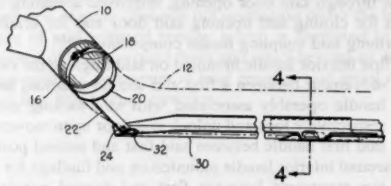
1. A motor support apparatus for supporting an outboard motor when the motor is rotated upon the transom of a boat transported by the trailer, which comprises:

a shaft having a first end and a second end;

attachment means for mounting the first end of said shaft on the trailer;

a V-shaped motor bracket mounted to the second end of said shaft, said bracket being oriented to receive a portion of the motor therein, said bracket including first and second members having mutually facing support surfaces disposed at an acute angle, each of said first and second members including a resilient, structural metal member, and a material secured to the metal member forming the support surface; said motor bracket comprising a generally V-shaped, formed metal component having a base and first and second portions extending therefrom, the resilient, metal members of the first and second members of said motor bracket comprising the first and second portions of the formed component, the first and second portions being flexible outwardly to receive motors of varying sizes therebetween.

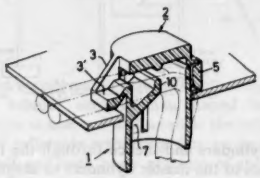
4,125,237
WASTE PIPE SUPPORT
James H. Hagins, Rte. 8, Lancaster, S.C. 29720
Filed Apr. 8, 1977, Ser. No. 785,923
Int. Cl.[2] F16L *3/00*
U.S. Cl. 248—49 **2 Claims**



1. An external waste pipe support for supporting an elongated flexible pipe which is adapted to extend from a fixed pipe carried on a trailer home such as a travel or portable trailer to a dumping receptacle for conveying waste from a collection tank provided in said trailer to the dumping receptacle, said support comprising:
- a mounting bracket,
- means for attaching said mounting bracket adjacent a juncture of said elongated flexible hose and said fixed pipe carried by said trailer home,
- a quick connector carried adjacent a remote end of said bracket,
- a first elongated channel shaped member adapted to receive a portion of said elongated flexible hose,
- a cooperating quick connector carried on one end of said first elongated channel shaped member for connecting with said connector carried on said bracket,
- a connecting flange member carried adjacent the other end of said first elongated channel shaped member and projecting below a bottom surface of said first rigid elongated channel shaped member,
- an intermediate channel shaped member,
- a plurality of longitudinal spaced holes provided in a bottom portion of said intermediate channel shaped member for adjustably receiving said connecting flange member of said first channel shaped member for connecting said first channel shaped member to said intermediate channel shaped member,
- said flange member when connecting said first channel shaped member to said intermediate channel member presses against a bottom surface of said intermediate channel member forcing an upper surface of said intermediate channel shaped member flush against a bottom surface of said first channel shaped member providing a rigid connection therebetween,
- an end elongated channel shaped member,
- a connecting flange member carried adjacent one end of a bottom surface of said end channel shaped member for being inserted in a hole provided in said intermediate member for connecting said end channel shaped member to said intermediate channel shaped member,
- whereby said channel shaped members are connected together for supporting said flexible pipe from said trailer to said dumping receptacle.

4,125,238
CORD HOLDER
Toshie Tanaka, Machida, Japan, assignor to Nifco, Inc., Tokyo, Japan
Filed Apr. 7, 1977, Ser. No. 785,490
Claims priority, application Japan, Apr. 9, 1976, 51-43155[U]
Int. Cl.[2] F16L *5/00*
U.S. Cl. 248—56 **1 Claim**

1. A one piece plastic right angle strain relief grommet or cord holder, comprising
- a substantially cylindrical hollow grommet member having a through bore and having a circumferentially disposed flange means provided intermediate the extremitites thereof and resilient engaging projections disposed at a distance from said flange means substantially equaling the thickness of an apertured panel adapted for accepting the cord holder therethrough;
- a hinge means including a central portion extending laterally from and connected by flexible means along one end of said central portion to said grommet member adjacent said flange;
- a lid member connected at one edge by flexible means to the opposite end of said hinge means central portion and said lid member being provided at the opposite free edge thereof with an outlet restraining means for passage of a cord;
- a projecting wall-like means disposed angularly from a point intermediate the extremities of the side wall of said grommet member defining said through bore in a direction toward said hinge means to form a constriction in the end

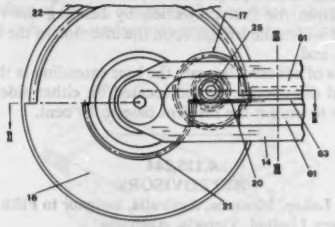


opening of said grommet member and thereby obstruct the movement of the cord inserted through said bore of said grommet member,
- cooperative means disposed opposite said hinge means for locking said lid member relative to said grommet member, said cooperative means for locking said grommet member and said lid member comprise respectively, at the side of the cord holder opposite to the points of connection of said member and lid with said hinge means, an engaging claw and an engaging window frame acting as said outlet of said lid member and adapted for engagement with said engaging claw so as to retain said grommet member and said lid member in their closed engagement,
- whereby when a cord is inserted through the bore of said grommet member and the outlet of said lid member and said lid member is brought into locked closed position relative to the end bore opening of said grommet member, said cord is bent into a right angle position relative to said panel and restrained against displacement.

4,125,239
PEDAL MECHANISM
Rene-Louis Berclaz, 24 rue de la Croix-Blanche, 1066 Epalinges, and Robert Fontannaz, route des Mouthes, 1343 Les Charbonnieres, both of Switzerland
Filed Jun. 28, 1977, Ser. No. 810,780
Claims priority, application Switzerland, Jun. 28, 1976, 8328/76
Int. Cl.[2] B62M *1/02*
U.S. Cl. 248—69 **3 Claims**

1. A pedal mechanism for a bicycle comprising a pedal crank formed of two telescopic elements, a planetary gear mounted on said first telescopic element, a toothed element mounted coaxially of said mechanism for meshing engagement with said planetary gear, and means for transforming rotational move-

ment of said planetary gear into reciprocating radial movement of said second telescopic element so that the length of said



crank varies between predetermined maximum and minimum values during rotation thereof.

4,125,240

SECURING DEVICE

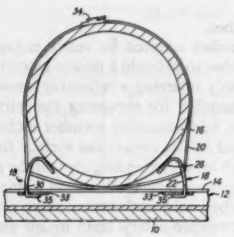
Robert A. H. Heard, Church Farm, 63 Church Lane, Backwell, Bristol, England (BS19 3JJ)

Filed Mar. 15, 1977, Ser. No. 777,855

Claims priority, application United Kingdom, Mar. 18, 1976, 11008/76; Jul. 22, 1976, 30490/76

Int. Cl.[2] E01F *9/01*

U.S. Cl. 248—218.4 **18 Claims**



1. An assembly comprising first and second bodies and a device securing them together, the first body having a channel member with a mouth restricted by inturned lips; the securing device comprising a pair of separate attachment members having means for attachment to said channel member by extending through the mouth and being retained therein by the inturned lips, the attachment members being attached to the channel on either side of said second body, and strap means associated with the attachment members tightened around the second body so as to clamp it to the channel, at least one of the attachment members being made of rigid sheet material and having non-adjustable attachment means comprising a neck part extending through the channel mouth, and a plate part rigidly carried by the inner end of the neck part in a plane substantially at right angles to the part of the neck part which extends through the channel mouth such that one major face of the plate part faces and bears against the channel lips, the junction between said neck part and said plate part being offset from the center of the plate part along the direction of the channel mouth such that at least a major portion of the plate part lies to one side of the junction with the neck part, the plate part being wider than the neck part so as to be retained by the channel lips engaging one major face of the plate part.

4,125,241

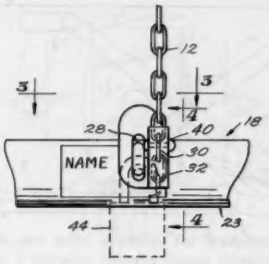
LOCKING PLATE MEMBERS FOR USE IN SYSTEM FOR OVERHEAD SUPPORT OF WEIGHTED ARTICLES

Junius T. Moore, Jr., Charleston, W. Va., assignor to The Moore Company, Charleston, W. Va.

Filed Mar. 7, 1977, Ser. No. 775,413

Int. Cl.[2] E05B *65/48*

U.S. Cl. 248—320 **5 Claims**



1. In a system for raising and lowering a weighted article between supported elevated and supported lower positions, the combination comprising:

an overhead support means;

pulley means supported from said overhead support means;

fixed attachment means supported within range of a person, said fixed attachment means including a locking bolt means having a shank portion and an enlarged looped end portion;

a link chain connected at one end to the article and passing vertically upwardly over said pulley means and extending downwardly and permanently connected at its other end to said attachment means, said link chain having a length when fully extended sufficient to permit said article to be suspended within range of a person and said chain having links with apertures too small to fit over the enlarged looped end portion of said bolt means; and

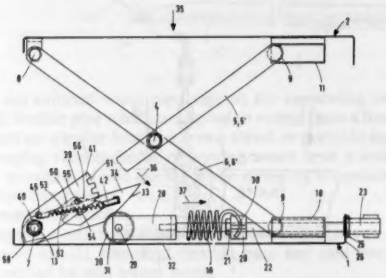
means on said chain positioned a predetermined distance from the end of said chain connected to said attachment means, said means being adapted to attach said chain to said bolt means when said chain is drawn downwardly to raise the article to the elevated position;

the improvement in said means adapted to attach said chain to said bolt means including a locking member having a tubular body portion of a size sufficient to slide axially over said link chain, the tubular body portion extending around said link chain and having an axial length sufficient to maintain the tubular body substantially coaxial with said link chain, a planar plate portion integral with said tubular body portion and projecting laterally therefrom, said planar plate portion having an elongated aperture therethrough of size sufficient to slip over the enlarged loop end portion of said bolt means, said plate portion having an edge adjacent said aperture curved back on itself to form said tubular body portion and means to anchor said tubular body portion permanently to said link chain without affecting said link chain's integrity at the predetermined distance from the end of said chain.

4,125,242
SPRING MOUNTED SEAT WITH HEIGHT ADJUSTMENT

Hermann Meiller, and Heinz Daunderer, both of Amberg, Fed. Rep. of Germany, assignors to Messrs. Willibald Grammer, Amberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 613,938, Sep. 16, 1975, abandoned. This application Feb. 9, 1977, Ser. No. 766,911
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1974, 2246516
Int. Cl.² A45D *19/04*
U.S. Cl. 248—399 **12 Claims**

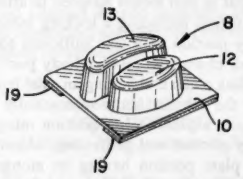


1. A seat of adjustable height having a seat part coupled by a connecting element to a supporting lever acted upon by supporting spring means, the lever being swingable against the action of the supporting spring means by a load acting on the seat part, the connecting element being adjustable relative to the supporting lever to change the height of the seat part, the improvement which comprises a locking device to lock said connecting element to said supporting lever in different relative positions, said locking device being comprised of a toothed segment, a detent co-operating with said toothed segment resiliently biased towards a position of engagement with said toothed segment, and a disengaging element which may act upon said detent to disengage said detent from said toothed segment, said locking device locking said connecting element and said supporting lever in a series of relative positions as said seat part is raised and wherein said locking device is placed in a disengaged condition when said seat part reaches an upper end position and is maintained in such disengaged condition until said seat part is lowered to a lower end position.

4,125,243
SIGN HOLDER

Richard M. Liptak, Parma Heights, Ohio, assignor to Integral Design, Inc., Valley View, Ohio

Filed Mar. 28, 1977, Ser. No. 781,703
Int. Cl.² A47F *7/14*
U.S. Cl. 248—473 **2 Claims**

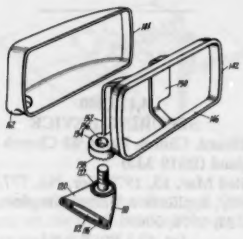


1. A sign holder, comprising:
a generally flat resilient base;
a first projection on the base having a convex, sloped side surface;
a second projection on the base having a concave, sloped side surface spaced apart from the convex side surface of the first projection forming an arcuate wedge-shaped trough therebetween for the insertion of the edge of a sign, the second projection capable of slight movement away from the first projection by bending the resilient base to widen the trough upon the insertion of the edge of a sign; and
two strips of adhesive beneath the base extending in the same general direction with and located on either side of the trough to permit the resilient base to be bent.

4,125,244
RETROVISORS

Leonard F. Lukey, Mentone, Australia, assignor to Fifth Patroy Proprietary Limited, Victoria, Australia

Filed Oct. 13, 1976, Ser. No. 732,064
Claims priority, application Australia, Oct. 13, 1975, 3547/75
Int. Cl.² B60R *1/06*
U.S. Cl. 248—475 B **7 Claims**



1. A retrovisor for mounting on a vehicle, said retrovisor comprising:
a frame member;
a housing member adapted for ready engagement with the frame member to provide a mirror assembly for receiving and releasably retaining a reflective means; and
a mounting member for mounting the mirror assembly on the vehicle, said mounting member including an annular plate located on the uppermost surface thereof, said plate having teeth means extending around the periphery of said plate, complementary teeth means being located on the frame member, said teeth means being adapted to engage with said complementary teeth means and oriented so as to allow the mirror assembly to be normally retained in a preset operating position and to cause said mirror assembly to pivot towards the vehicle in response to an application of a force applied to said assembly; wherein said complementary teeth means comprises an annular plate arranged on the lowermost surface of a mounting block provided on the frame member; wherein said mounting block has a centrally disposed circular aperture therein and is recessed into the frame member; and wherein there is provided on the frame member a second mounting block which is substantially in vertical alignment with the first-mentioned mounting block.

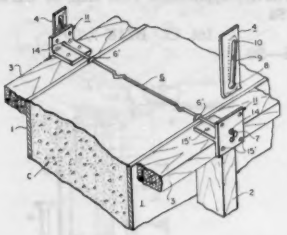
4,125,245
TOP RAIL TIE BRACKET FOR CONCRETE FORMS

Ludwig J. Seidl, 1637 Seaton St., Pittsburgh, Pa. 15226

Filed Feb. 17, 1977, Ser. No. 769,537
Int. Cl.² E04G *17/08*
U.S. Cl. 249—33 **2 Claims**

1. In combination with a concrete wall forming form comprising a pair of vertical, spaced parallel form panels with horizontal top rails engaging the outer top ends thereof and a snap tie rod extending across the top of the form and top rails and having a head at each end; the improvement comprising a bracket of T-shaped cross section on each end of said rod, each

bracket having right angular legs thereof snugly engaging the top and outer sides of the corresponding top rail and having holes therethrough for driving nails into said corresponding top rail, each bracket also having a central hole just above the top surface of the leg engaging the top side of the corresponding top rail, and a wedge between the outer vertical surface of



at least one of said brackets and the corresponding head having a keyhole opening and elongated slot for guiding the corresponding head of said tie rod while driving said wedge downwardly in sliding engagement with the outer vertical surface of said at least one bracket so as to apply tension to the tie rod with back-up support by the remaining right angular leg of said at least one bracket.

4,125,246

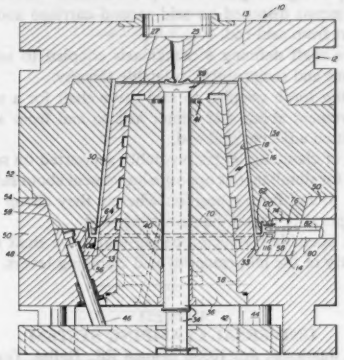
PIVOT ASSEMBLY MOLD APPARATUS

John W. von Holdt, 7430 N. Croname Rd., Niles, Ill. 60648

Continuation-in-part of Ser. No. 739,198, Nov. 5, 1976, abandoned. This application Jun. 13, 1977, Ser. No. 805,739

Int. Cl.[2] B29C *7/00, 11/00;* **B29F** *1/14*

U.S. Cl. 249—58 **26 Claims**



1. A mold assembly having a passage for forming a pivot assembly, the improvement comprising:

movable insert ring means having inner and outer surfaces and received in said passage to define a first annular bearing surface adjacent the outer surface of said insert ring means and a second annular bearing surface adjacent the inner surface of said insert ring means,

and movable means in said passage to define with said insert ring means a retaining mold cavity in spaced axial communication with one of said bearing surfaces and extending radially from the one bearing surface to a position radially intercepting the other bearing surface for forming bearing retaining means secured to said one bearing surface adapted to be flexed radially toward said one surface in response to the movement of said movable means in one direction and the successive movement of said ring insert means from between said bearing surfaces in said one direction for first engaging said retaining means and thereafter disengaging said retaining means to enable said retaining means to flex radially from said one surface to said position radially intercepting the other bearing surface for limiting relative axial movement between said bearing surfaces.

4,125,247

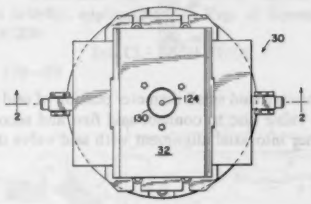
APPARATUS FOR MANUFACTURING FLUID SEALS

Kenneth F. Gabrys, Streamwood, Ill., assignor to Chicago Rawhide Manufacturing Company, Elgin, Ill.

Continuation of Ser. No. 378,494, Jun. 12, 1973, abandoned, which is a continuation of Ser. No. 137,207, Apr. 26, 1971, abandoned. This application Jan. 26, 1978, Ser. No. 872,490

Int. Cl.[2] B29C *7/00*

U.S. Cl. 249—66 R **11 Claims**



1. A multi-part mold assembly for manufacturing molded articles from a curable, initially fluent elastomeric material, said assembly comprising at least first and second, relatively movable mold parts each including surfaces thereon generally directed toward corresponding surfaces on the other of said mold parts, all of said surfaces combining to define a molding cavity having the shape of an article to be molded, said first mold part having a first land extending into said molding cavity along a first axis extending generally radially of said article, said second mold part having a second land extending into said molding cavity along an axis generally parallel to the axis of said article, said first and second lands thereby extending into said molding cavity at a substantially perpendicular angle to each other, whereby a finished article within said mold includes mutually perpendicular reentrant portions engaged respectively by said first and second lands, said first mold part being movable relative to the other of said mold parts along an axis parallel to said axis along which said first land extends, whereby when said mold is opened, said first mold part land is withdrawn from said article and said article is supported by said second mold part land against movement along said first axis and is positioned for removal thereof by movement of said article as a whole along an axis parallel to the extent of said second mold land.

4,125,248

BUTTERFLY VALVE

Masao Teramura, Hikone, Japan, assignor to Kazuhiko Nakajima, Shiga, Japan

Filed Apr. 7, 1977, Ser. No. 785,441

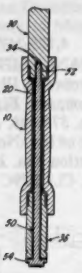
Claims priority, application Japan, Sep. 25, 1976, 51-114879

Int. Cl.[2] F16K *1/22*

U.S. Cl. 251—308 **4 Claims**

1. A butterfly valve comprising a valve disc, a tubular member having a through-hole extending therethrough positioned in said valve disc to form a diametrically extending throughhole in said valve disc, said through-hole consisting of large diameter portions at the opposite ends and a small diameter portion at the middle, said valve disc having outwardly bulging end regions proximate said large diameter portions of said through-hole and a middle region proximate said small diameter portion of said through-hole, said middle region being smaller in cross-sectional area than said outwardly bulging end regions so that said valve disc presents low fluid flow resistance or pressure loss, first and second valve stems having one of their respective ends engaged with said large diameter

portions of said through-hole of said valve disc so as to be rotatable integrally with said valve disc, and a connecting rod



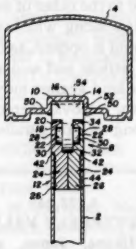
extending through said small diameter portion of said through-hole of said valve disc to connect said first and second valve stems together into axial alignment with said valve disc.

4,125,249

RAILING JOINT

Giuseppe P. Zen, 3475 Pandora St., Vancouver, British Columbia, Canada (V5K 1W7)

Filed Oct. 14, 1977, Ser. No. 842,020
Int. Cl.[2] E04B *17/14*
U.S. Cl. 256—67 **7 Claims**



1. A pivotable joint adapted to join an upright of metal railings to a top or bottom rail of said railings, the pivotable joint comprising:

a base adapted to be welded to the top or bottom rail with a first surface in contact with said rail;

a flange projecting outwardly from that surface of the base remote from the first surface;

aligned cylindrical lugs extending outwardly, one from each side of the flange;

a second member to engage the upright comprising two similar co-operating members, each co-operating member comprising a shank to engage the upright;

a bearing block attached to the shank;

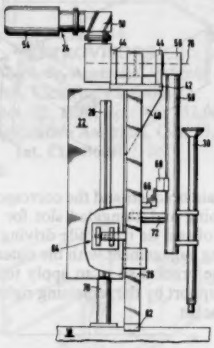
a recess in the bearing block to receive a cylindrical lug on said flange, whereby the base and the second member are pivotably joined.

4,125,250

FLAME-CUTTING MACHINE

Klaus Herbener, Bruchköbel, and Karlheinz Schmunck, Muhlheim, both of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Germany

Filed May 31, 1977, Ser. No. 801,772
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1976, 2625758
Int. Cl.[2] B23K *7/00*
U.S. Cl. 266—50 **10 Claims**



1. A flame cutting machine for cutting a continuously cast rod extending in a predetermined direction,

comprising in combination:

a first carriage movable in said predetermined direction,

a second carriage connected to said first carriage, movable therewith, and also relative thereto in a direction substantially at right angles to said predetermined direction,

drive means disposed on said second carriage and spaced apart from said rod,

a drive shaft defining a center axis coupled to said drive means and reciprocably rotatable thereby,

a cutting torch coupled to said drive shaft for a swinging movement about said center axis to and from a cutting position adjacent said rod,

a pair of clamping levers pivotably supported on said shaft and for simultaneous opposite movement about said center axis to and from a position wherein they clamp said rod temporarily during flame cutting, and

means operable for reciprocating said drive shaft independently of the movement of said clamping levers.

4,125,251

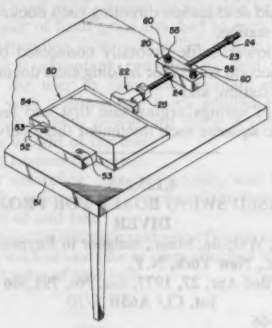
UNIVERSAL CLAMPING SYSTEM

Hugh V. Jamieson, Jr., 10555 Inwood Rd., Dallas, Tex. 75229

Filed May 2, 1977, Ser. No. 792,879
Int. Cl.[2] B25B *1/10*
U.S. Cl. 269—45 **1 Claim**

1. A clamping system comprising: a pressure foot having a force applying surface, a smooth walled blind hole formed along an axis perpendicular to said force applying surface opening at the opposite end of said pressure foot from said force applying surface, and a transverse slot intersecting said blind hole; a threaded rod engageable along one end with said blind hole in said pressure foot to apply a compression force through said rod to said pressure foot for urging said force applying surface of said pressure foot against a work piece; a flexible band for encircling said pressure foot through said transverse slot of said pressure foot to engage threads on said threaded rod for holding said pressure foot on said rod; a junction block having a first smooth walled hole to receive said threaded rod for supporting said rod while said pressure foot applies said force to said work piece, said junction block having at least one other hole extending in non-parallel, non-inter-

secting relationship with said first hole for support means for said junction block; and threaded nut means for coupling said



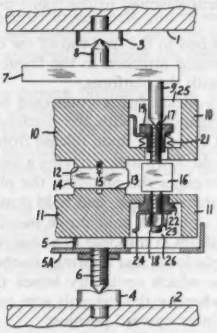
junction block with said threaded rod and transmitting a compression force to said rod from said junction block.

4,125,252

POWER SEMICONDUCTOR ASSEMBLY AND THE METHOD AND APPARATUS FOR ASSEMBLY THEREOF

Robert Jouanny, Montreuil-sous-Bois, France, assignor to Jeumont-Schneider, France

Division of Ser. No. 616,635, Sep. 25, 1975, Pat. No. 4,040,085. This application Apr. 21, 1977, Ser. No. 789,521
Claims priority, application France, Oct. 1, 1974, 74 33035
Int. Cl.[2] B23Q *3/08*
U.S. Cl. 269—47 **1 Claim**



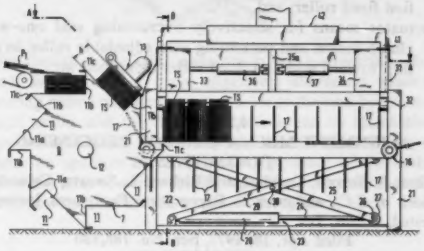
1. Apparatus for clamping at a selected pressure power semiconductors for assembly with radiators comprising, a support socket, and another socket movable toward and away from said support socket, a support plate having a central pivot extending from the plate and removably resting on the support socket, a clamping plate having an upstanding central pivot extending from the plate and removably seated on said another socket and having three rods extending from the clamping plate in a direction opposite to said central pivot thereof and parallel thereto, each rod having a conical tip portion, said rods being disposed with said tips thereof disposed at points corresponding to apices of an equilateral triangle, a centering piece having an opening through which said central pivot of said support plate extends for resting on said another socket, said centering plate having a peripheral rim and openings spaced in alignment with said rods, whereby a power semiconductor and housing thereof are disposable between two heat sinks each having three recesses on the margin and each having a through hole opening into said recess, each said recesses receiving a fastener assembly for assemblying the heat sinks together, each fastener assembly having a threaded rod extending through the corresponding hole in said recess for clamping an insulator therebetween and nuts on said rods for varying pressure applied to said insulator, and said openings in the centering plate being disposed to align with said recesses.

4,125,253

METHOD OF PROVIDING A STACK OF PREDETERMINED LENGTH AND APPARATUS FOR PERFORMING SAID METHOD

Jochen Wangermann, Appen, Fed. Rep. of Germany, assignor to Gruner & Jahr AG & Co., Schleswig-Holstein, Fed. Rep. of Germany

Filed Oct. 18, 1976, Ser. No. 733,043
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1975, 2547298
Int. Cl.[2] B65H *39/06*
U.S. Cl. 270—58 **21 Claims**



1. A method of forming a stack of predetermined length from a predetermined number N of part stacks, each having a plurality of relatively flat products, said method comprising the steps of:

forming N minus 1 part stacks with each of the part stacks having a predetermined number of products;

measuring the length of said N minus 1 part stacks normal to the planes of the flat products;

ascertaining the difference between the predetermined length and the combined length of said N minus 1 part stacks;

forming the Nth part stack with a variable number of products determined in accordance with said ascertained length difference so that the total length of N part stacks equals the predetermined length; and

combining the N part stacks into a final stack having the predetermined length.

4,125,254

AUTOMATED RADIAL ROLL FOLDER

Harold E. Boyer, Anna, Ohio, assignor to Bell & Howell Company, Sidney, Ohio

Filed Aug. 10, 1976, Ser. No. 713,322
Int. Cl.[2] B65H *45/14*
U.S. Cl. 270—68 A **10 Claims**

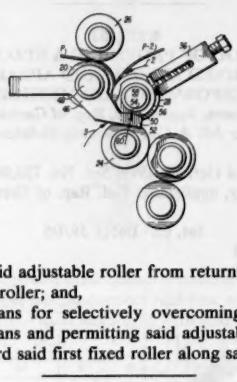
6. A folding machine in which the spacing between rollers can be set to accommodate paper stock of various thicknesses, said folding machine comprising:

at least two fixed rollers;

at least one adjustable roller, the position of which is adjustable relative to at least a first of said fixed rollers along an arc that is substantially concentric about the second roller to obtain an adjusted spacing between said first fixed roller and the adjustable roller;

an adjustable roller setting means for supporting said adjustable roller and causing said adjustable roller to move away from said first fixed roller along said arc in response to paper travelling through nips formed between said first fixed roller and said adjustable roller said adjustable roller

setting means including a one-way clutch means engaging said adjustable roller for allowing said adjustable roller to move away from said first fixed roller along said arc while simultaneously maintaining said adjusted spacing by pre-



venting said adjustable roller from returning toward said first fixed roller; and,

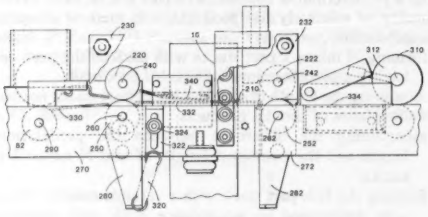
actuator means for selectively overcoming said one-way clutch means and permitting said adjustable roller to return toward said first fixed roller along said arc.

4,125,255

ALIGNMENT MECHANISM FOR PROCESSING DOCUMENTS

Milton A. Stovall, Camden, and Richard L. Swartz, Columbia, both of S.C., assignors to Recognition Equipment Incorporated, Dallas, Tex.

Filed Apr. 18, 1977, Ser. No. 788,180
Int. Cl.[2] B65H 9/16
U.S. Cl. 271—251 **3 Claims**



1. Alignment mechanism for document processing which transversely and vertically aligns documents to be read, said documents being transported serially at a constant rate comprising:

a horizontal tray having a flat floor and a longitudinal edge extending upward from said floor;

a plurality of rotating rollers with their axes at an approximately 75° angle to said longitudinal edge and parallel to said floor, each roller extending upward through a slot in said floor and slightly beyond said floor, said rollers urging said documents toward said longitudinal edge and along said edge to an end thereof;

a plurality of freely rotating balls horizontally constrained and urged downward, each ball being located above and resting against one of said plurality of rollers with at least one ball associated with each roller for allowing said documents to pass between each roller and its associated ball;

a read station for reading characters printed on said documents located adjacent said end of said longitudinal edge;

a first and second vertically movable rollers located on both sides of said reading station for guiding said documents past said read station, said first roller being located between said plurality of rollers and said read station;

a third and fourth rotating roller located above said first and second rollers, respectively, and moving said documents past said read station;

a stationary upper baffle extending from said first roller toward said read station directing each document beneath said read station;

a movable lower baffle pivotally connected between said first and second rollers for holding each document against said read station; and

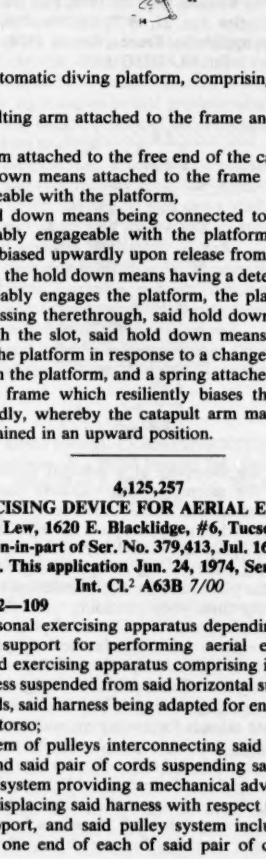
a plurality of springs urging said first and second rollers upward to squeeze each document there between.

4,125,256

SPRING BIASED SWING BOARD FOR PROJECTING A DIVER

Dean H. Weir, Walpole, Mass., assignor to Raymond Lee Organization, Inc., New York, N.Y.

Filed Apr. 27, 1977, Ser. No. 791,386
Int. Cl.[2] A63B 5/10
U.S. Cl. 272—66 **7 Claims**



1. An automatic diving platform, comprising:

a frame,

a catapulting arm attached to the frame and having a free end,

a platform attached to the free end of the cataputing arm,

a hold down means attached to the frame and releaseably engageable with the platform,

said hold down means being connected to the frame and releasably engageable with the platform, said platform being biased upwardly upon release from the hold down means, the hold down means having a detente, the detente releaseably engages the platform, the platform having a slot passing therethrough, said hold down means passing through the slot, said hold down means being released from the platform in response to a change of position of a user on the platform, and a spring attached to a front end of the frame which resiliently biases the catapult arm upwardly, whereby the catapult arm may be resiliently constrained in an upward position.

4,125,257

EXERCISING DEVICE FOR AERIAL EXERCISES

Hyok Sang Lew, 1620 E. Blacklidge, #6, Tucson, Ariz. 85719

Continuation-in-part of Ser. No. 379,413, Jul. 16, 1973, Pat. No. 4,052,070. This application Jun. 24, 1974, Ser. No. 481,856
Int. Cl.[2] A63B 7/00
U.S. Cl. 272—109 **3 Claims**

1. A personal exercising apparatus depending from a fixed horizontal support for performing aerial exercises above ground; said exercising apparatus comprising in combination:

a. a harness suspended from said horizontal support by a pair of cords, said harness being adapted for encircling a user's lower torso;

b. a system of pulleys interconnecting said horizontal support and said pair of cords suspending said harness, said pulley system providing a mechanical advantage in vertically displacing said harness with respect to said horizontal support, and said pulley system including a pair of cords, one end of each of said pair of cords being an-

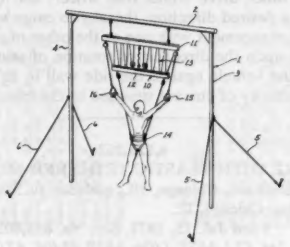
chored with respect to said pulley system and the other end of each of said pair of cords depending from said pulley system; and

c. a pair of hand grips adapted for grasping by the user, each of said pair of hand grips attached to each of said pair of cords depending from said pulley system; whereby, the mechanical advantage provided by said pulley system permits the user to raise and maintain oneself off the ground with a downward force applied to said pair of hand grips, which downward force is substantially less than the weight of the user;

wherein said harness comprises:

a belt for encircling the user's torso, said belt including means for adjusting the lengths of the front half and the rear half of said belt;

a pair of rings for securing said pair of cords suspending said harness, each of said pair of rings attached to diametrically opposed sides of said belt;



a first strap having bifurcated root for encircling one thigh of the user, first root of said first strap attached to the rear half of said belt, and an intermediate section of second root of said first strap inserted through one of said pair of rings and secured to said belt, end of said second root of said first strap depending from said belt including an adapter for selectably securing the free end of said first strap; and

a second strap having bifurcated root for encircling the other thigh of the user, first root of said second strap attached to the rear half of said belt, and an intermediate section of second root of said second strap inserted through another of said pair of rings and secured to said belt,

end of said second root of said second strap depending from said belt including an adapter for selectably securing the free end of said second strap; whereby, said first and second straps prevent said harness from sliding about the user's torso.

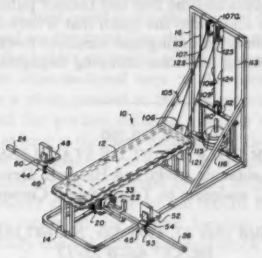
4,125,258

LIMB EXERCISING APPARATUS

James A. McArthur, #5-7459-13th Avenue, Burnaby, B.C., Canada (V3N 2E2)

Filed May 16, 1977, Ser. No. 797,431
Claims priority, application Canada, May 17, 1976, 252716
Int. Cl.[2] A63B *21/06*
U.S. Cl. 272—118 **17 Claims**

1. Apparatus for use by human beings to exercise their limbs, comprising a cam mounted to rotate back and forth around a central point between first and second positions, a surface on the cam positioned to move around said central point during rotation of the cam and having first and second opposite ends, an operator bar connected to the cam and extending outwardly therefrom to be moved by a limb being exercised to rotate the cam between said first and second positions around said central point, guide means adjacent the cam surface between said first and second ends, said surface moving back and forth past the guide means during said movement of the cam, a flexible connector, securing means for releasably connecting an end of the connector to the cam at selected positions along said surface on opposite sides of the guide means, said connector travelling over the guide means when the cam is rotated back and forth, said connector respectively wrapping over and unwrapping from the cam surface when the cam is rotated back and forth by the limb moving the operator bar effectively to shorten and lengthen the connector respectively, and resistance means connected to an opposite end of the connector to resist move-



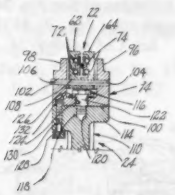
ment thereof while said connector is being effectively shortened, said connector being effectively shortened when the securing means connects the connector to the cam between the guide means and the first cam surface end or alternatively between said guide means and the second cam surface end when the operator bar is moved by pressure of the limb to move the cam towards the first position thereof or alternatively towards the second position thereof.

4,125,259

STRING CLAMPING DEVICE AND SUPPORT STRUCTURE THEREFOR FOR RACKET AND LIKE STRINGING MACHINES

Thurman P. Halbrook, St. Louis, Mo., assignor to Tennis Machines, Inc., St. Louis, Mo.

Filed Jun. 23, 1977, Ser. No. 809,457
Int. Cl.[2] A63B *51/14*
U.S. Cl. 273—73 A **16 Claims**



1. A string clamping device for use on racket and like stringing machines comprising an elongated housing having spaced and opposed side walls and open opposite ends, the side walls of said housing defining opposite sides of a channel which extends through the housing from one end to the other, a pair of elongated string engaging members having opposite ends and positioned extending lengthwise in said channel, means supporting said string engaging members for limited longitudinal and lateral movement in said channel, said support means including angularly related track means adjacent the respective opposite sides of said channel and means extending between said string engaging members normally biasing said members apart from each other and longitudinally on said track means toward said one end of the housing, said biasing means including at least two spring members which extend between the spring engaging members at spaced locations adjacent the respective opposite ends thereof, means cooperatively engageable between said pair of string engaging members so that they move longitudinally in concert in said channel including a pin member extending therebetween, a flange

formed on each of the opposed side walls of said housing, said flanges at least partially overhanging the respective string engaging members and together forming a relatively narrow slot through which a string can be moved and guided into and out of position between said pair of string engaging members, and means including said pin member extending between the string engaging members engageable by the string to be clamped when a reach of string is placed between the string engaging members and the free end thereof pulled at a predetermined angle relative to the reach that is between the string engaging members for urging said members toward said other end of the housing and into clamping engagement with the string.

4,125,260

TUBULAR GOLF SHAFT OF STAINLESS STEEL

John Kanne, Ashtabula, Ohio, and Harry E. Deverell, Natrona Heights, Pa., assignors to True Temper Corporation, Cleveland, Ohio

Filed May 17, 1976, Ser. No. 687,153
Int. Cl.[2] A63B *53/12*
U.S. Cl. 273—80 R **2 Claims**

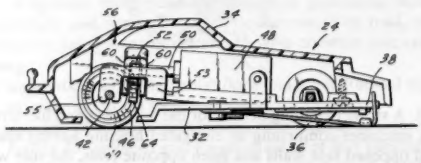
1. A tubular golf shaft made from a precipitation hardening or maraging stainless steel consisting of about 8% to 12% chromium, about 1.4% to 3.25% molybdenum, about 8% to 11% nickel, the sum of the chromium molybdenum and nickel being at least 18% and not exceeding 25%, at least one element selected from the group consisting of aluminum and titanium not exceeding 1.30%, carbon in a maximum amount of 0.06%, and manganese 0.50% maximum, and silicon in an amount not exceeding 0.30% maximum, the balance essentially iron and incidental impurities, said steel being in the martensitic form thereof and said shaft exhibiting a 200,000 psi minimum yield strength and toughness of 600 in.-lbs./in.^{2} measured at or near the tip of the shaft.

4,125,261

TOY VEHICLE AND TOY VEHICLE GAME

Robert G. Lahr, Reseda, Calif., assignor to Ideal Toy Corporation, Hollis, N.Y.

Continuation-in-part of Ser. No. 783,722, Apr. 1, 1977, Pat. No. 4,078,799, which is a division of Ser. No. 747,441, Dec. 6, 1976, abandoned. This application Jun. 20, 1977, Ser. No. 807,997
Int. Cl.[2] A63F *9/14*
U.S. Cl. 273—86 B **11 Claims**



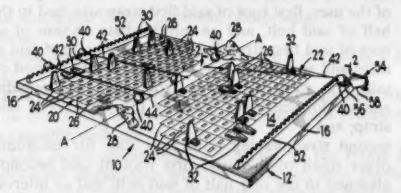
4. In a toy vehicle game including a guide track having a pair of upstanding laterally spaced side walls defining a pair of parallely extending lanes therebetween, and at least one toy vehicle on said track including a frame, a body mounted on said frame, a plurality of ground engaging wheels mounted in said frame including a pair of combination drive and steering wheels; means for mounting said drive wheels in said frame for independent rotation in laterally spaced fixed vertical planes; a reversible electric motor having an ouput shaft and being mounted in said frame in a fixed position and drive transmission means mounted in said frame for selectively drivingly connecting said motor to the respective drive wheels to drive one or the other of the drive wheels in a forward direction regardless of the direction of rotation of said motor while the other wheel free wheels and for biasing the vehicle to move in a direction opposite to that of the side of the vehicle on which the driven wheel is located; said drive transmission means including at least one transmission element movably mounted in the frame for movement between first and second positions in response to the direction of rotation of the drive motor and a pair of direct drive gear drive trains respectively associated with said drive wheels and directly drivingly engaged therewith to respectively drive one or the other of said drive wheels in said forward direction when engaged by said movable transmission element; wherein the improvement comprises said movably mounted transmission element including a gear support frame rotatably mounted in said vehicle for rotation in a plane generally perpendicular to said output shaft and having at least one idler gear rotatably mounted thereon and drivingly engaged with said output shaft; said idler gear being located on said support frame for selective engagement with one or the other of said direct drive gear trains in said first and second positions in movably mounted transmission element to drive one or the other of the drive wheels in the forward direction while the other drive wheel free wheels and thus steer the vehicle in a desired direction, thereby to cause said vehicle to move into engagement with one or the other of said side walls depending upon the direction of rotation of said output shaft and hold the vehicle against the side wall in its selected lane until the polarity of current supplied to the motor is reversed.

4,125,262

GAME WITH ELASTIC TETHERED MISSILES

Erick E. Erickson, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Jul. 15, 1977, Ser. No. 815,802
Int. Cl.[2] A63F *1/04*; A63B *63/04, 67/10*
U.S. Cl. 273—101 **18 Claims**



1. A game device comprising:

a base providing a playing surface defining a plurality of play areas on opposite portions for supporting one or more playing pieces of an opposing player, said base including an opening spaced between said play areas;

a plurality of playing pieces adapted for movement around said play area between a back line thereof and a front line adjacent the area of an opposing player, said playing pieces normally standing upright on said base and movable to a knocked down position when struck by a moving missile released by an opposing player;

at least one missile adapted to move along a path determined by the player for striking and knocking down the playing pieces of opposing players;

an elongated elastic member secured at one end to said missile and securable to said game device between said play areas, said elastic member extending through said opening and said opening of said base shaped to include wedging surfaces for retaining tension on said elastic member when extended toward said missile holding means of one player;

missile holding means on said base along the back line of each player area for temporarily holding said missile in place at a selected position along said back line with said elastic member under tension, said missile holding means including a wall member along said back line projecting upwardly of said base and formed with a plurality of notches therein for said elastic member, whereby said elastic member can be angularly adjusted on said base by

placement in a selected notch to align said elastic member with a playing piece of an opposing player; and

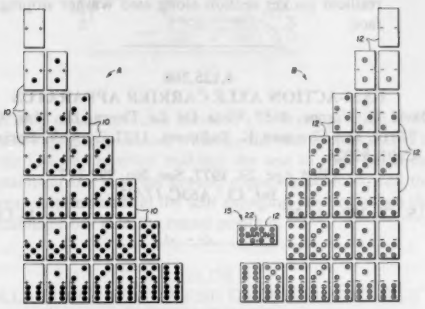
means for releasing said missile from said holding means to be propelled by contraction of said elastic member toward an upstanding playing piece in an opponent's play area.

4,125,263

DOMINO GAME

Joe W. Hamilton, 1390 Market St., Apt. 2224, San Francisco, Calif. 94102

Filed Jul. 7, 1977, Ser. No. 813,596
Int. Cl.[2] A63F 9/20
U.S. Cl. 273—293 **11 Claims**



1. Game apparatus, comprising:

two sets of game pieces, the game pieces of the one of the two sets being equal in number to the game pieces of the other of the two sets, each one of the game pieces having a space and first indicia thereon forming a pair of numerals on the face uniquely identifying each one of the game pieces of each one of the sets, the numerals formed on each one of the game pieces of the one set corresponding to like numerals formed on one of the game pieces of the other set, the highest numeral used on the face of the game pieces being N, the number of game pieces totaling $(N+1)(N+2)$, the first indicia including means for distinguishing the game pieces of the one set from the game pieces of the other set; and

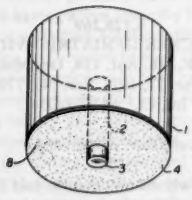
second indicia on the face of a predetermined one of the game pieces of the one set to denote special game playing powers of said predetermined game pieces.

4,125,264

RECORD POSITIONING DEVICE

Theodore Reiss, 749 E. 22nd St., Brooklyn, N.Y. 11210

Filed Jul. 25, 1977, Ser. No. 818,947
Int. Cl.[2] G11B 1/00
U.S. Cl. 274—1 R **11 Claims**



1. As an article of manufacture, a phonograph record handling device comprising means substantially non-visually aligning the central hole in the phonograph record with a spindle of a record player turntable made of magnetically responsive material and having a convex top surface, including;

a holder block having a bottom record engaging surface, at least a portion of which is flat;

and a permanent magnet rigidly mounted in said holder block having an outer dimension to fit snugly into the center hole of the record and perpendicularly protruding from said flat surface portion of the holder block by a distance at least equal to the thickness of the record to be positioned on the turntable; the record engaging surface area of the holder enclosing an area several times greater than the cross-sectional area of the permanent magnet taken in a plane parallel to the flat record engaging surface, said flat portion defining a record bearing surface located at least at the outer periphery of the record engaging surface to maintain the record in a plane at right angles to the direction of protrusion of said magnet to enable a firm, positive engagement of the record handling device with the record at the central location thereof and to substantially non-visually locate said block at the center of said record;

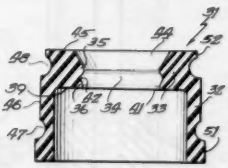
wherein at least the flat portion of the bottom surface of the holder is provided with a shock absorbing surface to prevent damage to the record as the magnet is inserted into the whereby the positioning device will induce a magnetic flux in the spindle when the permanent magnet is brought into the vicinity of the spindle and, when associated with a record, will permit the user to substantially non-visually sense alignment of the center hole of the record with the spindle.

4,125,265

VALVE STEM SEAL

Anthony J. Grzesiak, Burnham, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jul. 6, 1977, Ser. No. 813,370
Int. Cl.[2] F16J 15/32
U.S. Cl. 277—152 **11 Claims**



1. A valve stem seal adapted to be mounted on the end of a cylindrical valve guide boss, comprising an annular skirt portion adapted to encompass the valve guide boss and a transversely extending wall at the upper end abutting the upper surface of the boss and sealingly engaging a valve stem, the wall having an internal surface providing a pair of axially spaced annular sealing lobes separated by an annular groove closely adjacent the upper surface of the boss, the lower surface of said transverse wall intersecting the lowermost sealing lobe to form an abrupt corner, and means above said sealing lobes to promote capillary flow of oil to said sealing lobes comprising an upwardly and outwardly tapered internal surface extending to the upper surface of said wall.

4,125,266

LIP SEALING RING AND METHOD FOR ITS MANUFACTURE

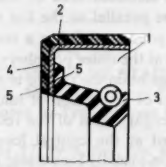
Wolf-Dieter Schonherr, Leverkusen; Karl-Heinz Wolfert, Burscheid, and Veit Lachmann, Monheim, all of Fed. Rep. of Germany, assignors to Goetzewerke Friedrich Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Nov. 23, 1977, Ser. No. 854,222

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1976, 2653457

Int. Cl.[2] F16J *15/32*

U.S. Cl. 277—153 **6 Claims**



1. In a lip sealing ring made of two elastomer materials including a first portion made of a first elastomeric material which is non-fluoroelastomer, a sealing lip portion made of a fluoroelastomer, and an embedded reinforcing metal ring, the improvement wherein the non-fluoroelastomer material is an acrylelastomer consisting of a terpolymer of ethylene, methylacrylate and carboxyl containing monomer, with the sealing lip portion and the non-fluoroelastomer portion being vulcanized to the metal ring with a binder comprised of a mixture of monomeric silanes.

4,125,267

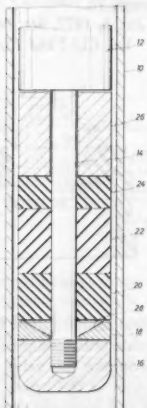
WELL PACKER INCLUDING ANTI-EXTRUSION WASHER

Lloyd C. Rathburn, Friendswood, Tex., assignor to Loomis International, Inc., Pasadena, Tex.

Filed Jul. 11, 1977, Ser. No. 814,290

Int. Cl.[2] F16J *15/10*

U.S. Cl. 277—188 A **7 Claims**



1. In combination with a packer assembly for sealing a well pipe, including

an upward unit,

a tool stem carried by the upward unit and depending therefore, and

a lower unit connected to the tool stem, said upward unit operably connected to move toward said lower unit to apply pressure to a packer unit positioned intermediate between the upward unit and lower unit,

the improvement in a packer unit, comprising

a washer surrounding the tool stem having an inwardly sloping surface such that the thickness of said washer is greater at its outer dimension than at its inner dimension and having hardness qualities such that said washer maintains shape integrity under packer pressure without breakage,

a resilient packer section having a surface adjacent the inwardly sloping surface of said washer which, in the absence of applied packer pressure, is closer at the outer dimension of said sloping surface than elsewhere,

applied packer pressure causing extrusion tendency of said resilient packer section along said washer sloping surface.

4,125,268

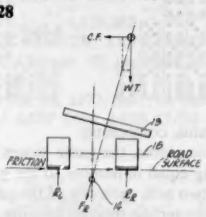
CAM-ACTION AXLE CARRIER APPARATUS

David O. Varner, 4657 Vista De La Tierra, De Mar, Calif. 92014, and Sherman E. DeForest, 1127 Cornish, Encinitas, Calif. 92024

Filed Apr. 29, 1977, Ser. No. 792,117

Int. Cl.[2] A63C *17/02*

U.S. Cl. 280—11.28 **14 Claims**



1. Apparatus for use in turning an axle of a small wheeled vehicle having a bed tiltable by a rider for providing a steering function such as that found on a skateboard or the like, said apparatus comprising:

a. axle retention means for retaining the axle and for controlling the turning motion of the axle;

b. a base mounting plate connected to the tiltable bed of the vehicle;

c. support means for supporting the tiltable bed and plate over the axle retention means, the support means being connected at one end to the base mounting plate, the support means being adapted for rolling contact with the axle retention means to provide a low roll center of the bed and to keep the total load vector near the center of the axle during a turn of the vehicle; and

d. means for retaining the axle retention means in cooperative association with the support means and base mounting plate.

4,125,269

RECLINER-ROCKER GERIATRIC WHEEL CHAIR

Louise A. Kiel, 700 E. 5th, Apt. 114, Des Moines, Iowa 50316

Filed Mar. 21, 1977, Ser. No. 779,469

Int. Cl.[2] A47C *1/034*

U.S. Cl. 280—30 **11 Claims**

1. A geriatric wheel chair, comprising:

a frame;

ground engaging wheels mounted to said frame;

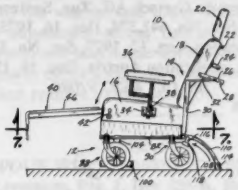
a chair member having a seat portion and a back portion mounted to said frame;

means for rockably mounting said chair member to said frame; and

a unitary member pivotally attached to the rear of said frame said unitary member consisting of:

a stabilizer bar movable between a ground engaging position and a raised position;

a braking means movable between a wheel engaging position and a raised position, whereby the braking means is in the wheel engaging position when the stabilizer bar is in the ground engaging position, and the braking means is in the raised position when the stabilizer bar is in the raised position; and



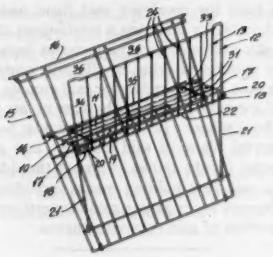
rear stop means movable between a lowered position and a seat engaging position, whereby the rear stop means is in the lowered position enabling the seat to rock when the stabilizer bar is in the ground engaging position, and the rear stop means is in the seat engaging position when the stabilizer bar is in the raised position.

4,125,270

COLLAPSIBLE SEAT IN END GATE FOR NESTABLE SHOPPING CART

Antoine Trubiano, 1410-7th Avenue, Pointe aux Trembles, Quebec, Canada

Filed Mar. 30, 1977, Ser. No. 782,952
Int. Cl.² B62B *11/00*
U.S. Cl. 280—33.99 B **7 Claims**



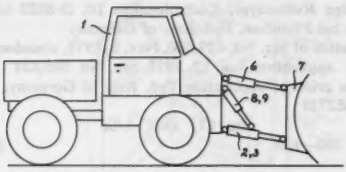
1. In a collapsible seat pivotally secured to an end gate of a nestable shopping cart, said seat having a seating surface and being slidingly attached to a collapsible secondary gate which is hinged to said end gate and which provides a back rest for said seat, the improvement comprising said seat having opposed side end members pivotally secured at one end to said end gate and each having a free inwardly facing hook end, said side end members extending substantially parallel to one another, a connecting rod secured to each of said side end members and extending adjacent to said hook ends to define an open ended guide channel between said hook end and said connecting, rod, said secondary gate having opposed side end edges received in a respective guide channel, each guide channel being restricted for sliding displacement along its respective end edge in the area of said back rest, said secondary gate has an outwardly turned upper end edge defining a top edge of said back rest, a stop rod secured across said side end edges adjacent a lower edge of said back rest, a back rest frame secured between said top edge and said stop rod whereby said back rest frame extends angularly outwards from said side end edges toward said top edge of said back rest, each hook end lying behind an outer surface of said back rest frame when said secondary gate is collapsed in the direction of said end gate.

4,125,271

TOOL SUSPENSION

Alfred E. J. J. Wiboltt, Birkeröd, and Jorgen Rosenberg, Holte, both of Denmark, assignors to RO-WI Rosenberg & Wilboltt I/S, Birkeröd, Denmark

Filed Jun. 25, 1976, Ser. No. 700,019
Claims priority, application Denmark, Jun. 11, 1976, 2621/76
Int. Cl.² B60D *1/00*
U.S. Cl. 280—461 A **4 Claims**



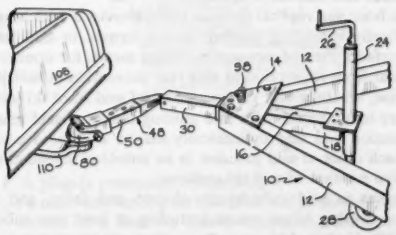
1. A tool suspension for either front or rear mounting of tools from vehicles, comprising a three-point suspension having two lower laterally spaced link type arms hingedly connected at one end of each to the vehicle and at the lower end of each to the tool, an upper intermediate arm hingedly connected at one end to the vehicle and at the other end to the tool, and hydraulic mechanism connected to actuate said lower arms to lift and lower the tool, characterized in that the hydraulic mechanism comprises means to selectively actuate said lower suspension arms independently of each other, means providing a neutral position for said hydraulic mechanism to release the tool from vertical pressure to ride freely upon the ground, and said hinged connections being universally movable.

4,125,272

SELF-ALIGNING TOWING HITCH

Cecil J. Putnam, Jr., and James E. Malone, both of Union City, Mich., assignors to Putnam Pattern & Engineering Co., Coldwater, Mich.

Filed Mar. 14, 1977, Ser. No. 776,830
Int. Cl.² B60D *1/16*
U.S. Cl. 280—478 B **7 Claims**



1. A self-aligning towing hitch for interconnecting tow and towed vehicles comprising, in combination, an elongated guide adapted to be fixed upon one of the vehicles, a slide movably mounted on said guide for movement in the direction of normal vehicle movement between retracted and extended positions, an elongated arm having an inner end, an outer end and lateral sides, pivot means connecting said arm inner end to said slide for pivotal movement about a vertically extending axis, first hitch means mounted on said arm adjacent said outer end adapted for connection to second hitch means mounted on the other vehicle, orientation means fixed with respect to said

guide and disposed adjacent said arm lateral sides during retraction of said slide whereby retraction of said slide produces engagement of said arm lateral sides with said orientation means if said arm is misaligned with respect to said guide to pivot said arm into alignment with said guide and slide direction of movement, detent means interposed between said slide and arm having an operative position restricting pivotal movement therebetween about said pivot axis upon a predetermined angular alignment between said arm and slide direction of movement being achieved, and locking means fixing said arm with respect to said guide upon said slide being retracted.

4,125,273

SEPARABLE OR FOLDABLE SKI

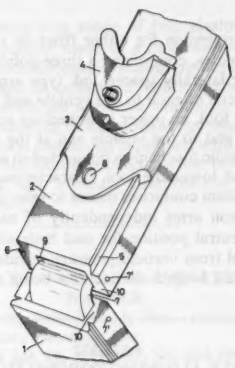
Karl-Heinz Rothmayer, Kastanienallee 10, D-8023 Grosshesselohe bei Munchen, Fed. Rep. of Germany

Continuation of Ser. No. 629,600, Nov. 6, 1975, abandoned. This application Jun. 13, 1977, Ser. No. 805,631

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1974, 2452728

Int. Cl.[2] A63C *5/02*

U.S. Cl. 280—603 **3 Claims**



1. A foldable ski which comprises:

a front ski section and a rear ski section having upper, lateral and skiing surfaces, and cylindrically-shaped end faces being complementarily cylindrical to each other with their cylinder axis extending substantially parallel to said skiing surfaces and transversely to the longitudinal direction of the ski, the end faces defining a junction of said front and rear ski sections;

said front and rear ski sections being provided with longitudinally extending guiding means formed in said lateral surfaces thereof, connecting hinge means for connecting said front ski section to said rear ski section at said junction, whereby said guiding means of said front ski section are in alignment with said guiding means of said rear ski section and said cylindrically-shaped end faces contact each other at said junction in an unfolded extended relative position of said ski sections;

recesses in said cylindrically-shaped end faces, and said connecting hinge means including at least one substantially U-shaped hinge part spanning said junction between said front and rear ski sections and arranged in said recesses, said hinge part being attached to said respective ski sections by means of hinge pins passing transversally to said respective ski sections through free ends of legs of said U-shaped hinge part;

a U-shaped stabilizing device having inwardly extending engaging means on each leg of said U-shaped stabilizing device, said stabilizing device being slidably mounted on one of said ski sections in a folded relative position thereof and adapted to cover said junction of said ski sections in said unfolded extended relative position thereof, thereby said engaging means guidably engage said guiding means of said ski sections for effecting the stabilized positioning of said front ski section to said rear ski section; and

locking means for fixing the stabilized positioning of said stabilizing device relative to said ski sections.

4,125,274

SAFETY SKI BINDING AND SKI BOOT COMBINATION

Axel R. Kubelka, Vienna, and Josef Svoboda, Schwechat, both of Austria, assignors to Gertsch AG, Zug, Switzerland

Continuation of Ser. No. 641,376, Dec. 16, 1975, abandoned. This application Aug. 12, 1977, Ser. No. 824,142

Claims priority, application Austria, Dec. 19, 1974, 10131/74

Int. Cl.[2] A63C *9/086*

U.S. Cl. 280—618 **13 Claims**

1. A combination safety ski binding and ski boot construction, said ski boot having a shell with laterally spaced sides and an arcuate surface at the heel thereof, comprising:

a thin and flexible sole on said ski boot terminating at the forwardmost and rearwardmost extent of a toe and a heel of said shell of said ski boot;

sole rigidifying means on said ski boot to prevent a flexing of said sole at least at the toe and heel thereof;

front and rear holding means mounted on a ski; and

front and rear receiving means at said toe and said heel of said ski boot for receiving said front and rear holding means thereon for effecting a securement of said ski boot to said ski, said rear receiving means being an elongate shoulder structure having an effective portion occupying no more than ⅓ of the radius for said arcuate surface beginning and extending rearwardly from points on the sides of said ski boot where a plane perpendicular to the longitudinally central plane of said ski boot and containing the center point for the radius intersects the side walls of said ski boot, said rear holding means including engagement means thereon for engaging said elongate structure only in said ⅓ portion of said receiving means.

4,125,275

SAFETY SKI BINDING

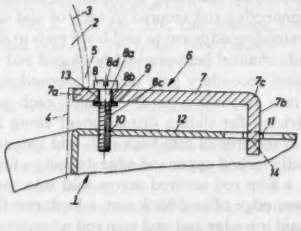
Erwin Krob, Vienna, and Josef Svoboda, Schwechat, both of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Aug. 31, 1977, Ser. No. 829,578

Claims priority, application Austria, Sep. 2, 1976, 6497/76

Int. Cl.[2] A63C *9/08*

U.S. Cl. 280—626 **18 Claims**



1. In a combination of a ski boot and a ski binding, said ski boot having a lower shell and an ankle cuff pivotally secured to said lower shell to allow pivotal movement of said ankle cuff

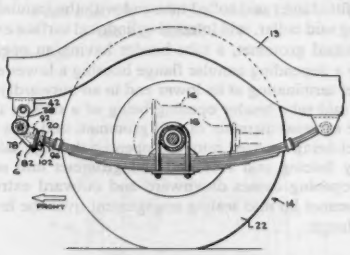
about a pivot axis in response to shifts in the weight of an individual using said ski boot, said ski binding including at least a heel holder engaging the heel portion of said ski boot to hold said heel portion to a ski, said ankle cuff having projection means extending rearwardly therefrom and includes first means thereon defining a downwardly facing first surface, said heel holder including second means defining an upwardly facing second surface, said first surface directly engaging said second surface to limit the amount of pivotal movement of said ankle cuff to the rear of said lower shell, the improvement comprising adjustment means operatively connecting said second means to said heel holder for adjustably supporting said second means to effect a varying of the vertical height of said second surface relative to said ski boot.

4,125,276

FOUR WHEEL DRIVE STABILIZER

Joseph E. Levasseur, Rte. 1, Box 238-A, Rockville, Va. 23146

Filed Nov. 23, 1977, Ser. No. 855,066
Int. Cl.[2] B60G *13/00*
U.S. Cl. 280—718 **7 Claims**



1. A stabilizer apparatus particularly adapted to prevent excessive vibration in leaf spring type front wheel assemblies of four-wheel drive vehicles, said stabilizer apparatus comprising a stabilizer shaft mountable adjacent the leaf springs, a coupling shaft and a stabilizer coupling at each end of said stabilizer shaft, each said couplings having a first bearing mounted on said stabilizer shaft for rotation about the axis of said stabilizer shaft and a second bearing fixed to said first bearing and having an axis spaced apart and generally parallel to the axis of the first bearing, said second bearing mounted on said coupling shafts for rotation about the axes of said coupling shafts.

4,125,277

SAFETY BELT ARRANGEMENT WITH A BELT HANGER

Yoshinori Akiyama; Kenshi Kurami, both of Yokohama; Junichiro Takeshita, Kamakura, and Takeo Furuya, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Continuation of Ser. No. 713,239, Aug. 10, 1976, abandoned, which is a continuation of Ser. No. 597,712, Jul. 12, 1975, abandoned. This application Sep. 15, 1977, Ser. No. 833,670
Claims priority, application Japan, Jul. 22, 1974, 49/83912
Int. Cl.[2] B60R *21/02*
U.S. Cl. 280—745 **1 Claim**

1. In combination with a vehicle body including a floor and a roof defining an occupant compartment having a vehicle seat accessible through a vehicle body opening selectively opened and closed, a vehicle body door having a front edge pivotally secured to the vehicle body for selectively opening and closing said vehicle door opening,

an occupant restraining belt arrangement comprising:

a lap belt having one end fixed to a lower rear portion on the inside of the door;

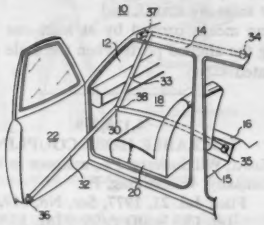
a first inertia retractor mounted adjacent a lower inboard portion of the seat, the first inertia retractor receiving the other end of said lap belt;

a shoulder belt having one end secured to an intermediate portion of said lap belt;

a second inertia retractor mounted adjacent an outboard portion of a roof of the vehicle body behind the seat, the second inertia retractor receiving the other end of said shoulder belt;

a belt hanger fixedly mounted on the vehicle body within the occupant compartment forward and above the seat;

the length along said lap belt between the one end of said lap belt and the intermediate portion of said lap belt and the length of said shoulder belt when said shoulder belt is fully extended from said second inertia retractor being so determined as to provide an arrangement in which when said shoulder belt is hung on said belt hanger and the door is opened to its fully opened position, said lap belt and said shoulder belt assume position for easy entry of an occupant in which said intermediate portion of said lap belt takes a position spaced forward of the body of an occupant of the seat, and when said shoulder belt is removed from said belt hanger and the door is closed, said lap belt and said shoulder belt take an occupant-restraining position in which said intermediate portion of said lap belt takes a position adjacent an inboard portion of the seat so that said shoulder belt extends across the chest of the occupant of the seat.

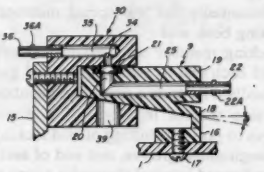


4,125,278

PLUG-IN CONNECTOR

Donald E. Hargraves, 54 Harbor St., Pepperell, Mass. 01463

Filed May 31, 1977, Ser. No. 802,180
Int. Cl.[2] F16L *3/00*
U.S. Cl. 285—61 **3 Claims**



1. A plug-in connector comprising

(1) a male unit having an elongate wedge shaped body connected to a base by means supporting the body while permitting the body to flex toward and away from the base, the base being adapted for attachment to a support, the body having a longitudinal passage in it extending from the wide end of the wedge toward the narrow end, the end of the longitudinal passage at the wide end of the wedge terminating in means for accommodating an external connection to that passage, a transverse passage in the body adjacent the narrow end of the wedge, the transverse passage terminating at one end in a port at the body's surface, the transverse passage being normal to the longitudinal passage and connected to it,

(2) a female unit having a cut-out extending from a surface of

said female unit and terminating at an interior part of said female unit shaped to receive the wedge shaped body of the male unit, the cut-out having ramp means for causing the male unit to more firmly mate with the female unit as the wedge shaped body of the male unit progresses into the cut-out, the female unit having a longitudinal passage terminated in means for accommodating an external connection to that passage, a transverse passage in the female unit normal to the longitudinal passage therein, the transverse passage being connected to the longitudinal passage in the female unit and terminating at the surface of the female unit in a port situated to align with the port of the transverse passage in the male unit when the male and female units are mated, and

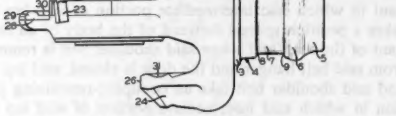
(3) sealing means carried by at least one of the units for sealing the aligned ports when the male and female units are mated.

4,125,279

LOCKABLE HOSE COUPLING

Daniel G. Scott, Wilkinsburg, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Jul. 21, 1977, Ser. No. 817,651
Int. Cl.[2] B60D *1/08*; F16L *35/00*
U.S. Cl. 285—69 **10 Claims**



1. A hollow hose coupling comprising:

(a) a hollow body having integral therewith a lip provided with a lip bead on which is formed a lip bearing and a guard arm having a guard arm groove for receiving therein the lip bead of the other one of a pair of coupled hose couplings, wherein the improvement comprises:

(b) a mounting boss fixed to the outside of said hollow body and having formed therein a longitudinal groove and a pair of coaxial transverse grooves disposed on the respective opposite sides of and intersecting said longitudinal groove,

(c) a substantially flat leaf spring member secured to said mounting boss, and

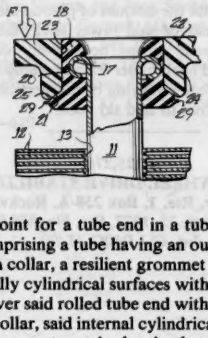
(d) a locking member disposed in and extending outward beyond each end of said longitudinal groove and having intermediate its ends a wing-like member extending from each side thereof into one of said pair of transverse grooves to prevent shifting of said locking member within said longitudinal groove, one end of said locking member having formed integral therewith a stop and the other end constituting a handle by which said locking member may be manually rocked in one direction to lift said stop out of the pathway of the guard arm of the other one of a pair of hose couplings to be manually coupled to enable rotation of either one of said pair of hose couplings, relative to the other, until said pair of hose couplings occupy their fully coupled positions, whereupon said leaf spring member is operative, in response to the release of said handle, to rock said locking member in a direction opposite said one direction to a position in which said stop in abuttingly disposed against one end of said guard arm of said other one of said pair of hose couplings thereby preventing unwanted relative rotation and consequent uncoupling of said pair of fully coupled hose couplings so long as said locking member is maintained in said position by said leaf spring member.

4,125,280

MULTITUBE HEAT EXCHANGER

Josef J. Kuzel, Mississauga, Canada, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jun. 6, 1977, Ser. No. 803,701
Int. Cl.[2] F16L *39/00*
U.S. Cl. 285—137 R **7 Claims**



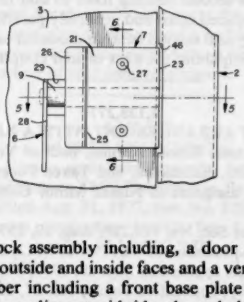
2. A sealed joint for a tube end in a tube header for a heat exchanger, comprising a tube having an outwardly rolled tube end providing a collar, a resilient grommet having internal and external generally cylindrical surfaces with an internal annular groove fitted over said rolled tube end with the annular groove receiving said collar, said internal cylindrical surface extending through said grommet, a tube header having an opening defined by a depending annular flange housing a lower end, said grommet terminating at its lower end in an outwardly extending lip, said tube header opening being of a smaller diameter than the external diameter of said grommet, said tube end and grommet being inserted into said opening through said flange whereby forcing said tube end and grommet into said tube header opening causes downward and outward extrusion of said grommet lip into sealing engagement over the lower end of the flange.

4,125,281

DOOR LOCK ASSEMBLY

John H. Dean, and Albert Dean, Jr., both of San Antonio, Tex., assignors to Deansteel Manufacturing Company, San Antonio, Tex.

Filed Aug. 9, 1977, Ser. No. 823,090
Int. Cl.[2] E05C *1/04*
U.S. Cl. 292—148 **5 Claims**



1. A door lock assembly including, a door having a panel provided with outside and inside faces and a vertical side edge, a handle member including a front base plate affixed to said panel outside face adjacent said side edge, a bolt guide member affixed to said panel inside face behind said handle member, said door side edge and guide member having spaced apart horizontally aligned openings, an elongated linear bolt having a nose disposed through said side edge opening and a base portion extending through said guide member opening, said panel provided with a cut-out juxtaposed said bolt base portion, a bolt actuator transversely disposed through said cut-out having a bolt section inside said panel secured to said bolt base portion and a lock section disposed outside said panel, a planar stabilizing plate affixed to said actuator inside bolt section and projecting normal thereto away from said bolt base portion and in sliding overlying engagement with said panel inside face with the vertical and horizontal extent of said stabilizing plate

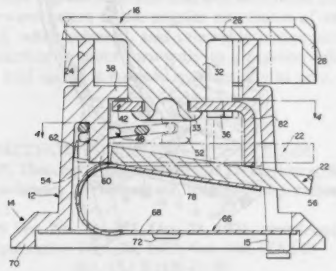
no less than the corresponding dimensions of said underlying panel cut-out, said handle member provided with a lock plate projecting outwardly from said front base plate adjacent said panel cut-out, an offset handle plate extending from said lock plate in a direction at least partially overlying said panel cut-out, said panel cut-out extending horizontally from a point adjacent said lock plate to a point restricting displacement of said bolt nose to an area adjacent said panel side edge opening, said lock section and lock plate including horizontally aligned openings adapted to receive the shackle of a locking device whereby, said bolt is selectively displaceable to extend said nose substantially beyond said door side edge by manually displacing said actuator lock section toward said handle member lock plate and behind said handle member offset plate at which point said lock section and lock plate openings are juxtaposed.

4,125,282

TURNBUTTON LATCH

Lazlo Bako, Woodcliff Lake, N.J., assignor to Presto Lock Company, Division of Walter Kidde & Company, Inc., Garfield, N.J.

Filed Jun. 29, 1977, Ser. No. 811,304
Int. Cl.[2] E05C 3/14
U.S. Cl. 292—336 **14 Claims**



1. A turnbutton latch male part comprising a hollow stud having one end adapted to be mounted on a support and having a turnbutton mounted on the other end for limited turning movement between an open position at which a female part can be placed over said turnbutton and said stud and a closed position at which said turnbutton prevents removal of the female part from said stud, a bolt fixed to said turnbutton within said stud, first spring means in said stud biasing said turnbutton to said closed position, a trigger supported in said stud for movement toward and away from said turnbutton and having an end projecting through a slot in a side wall of said stud, second spring means within said stud biasing said trigger toward said turnbutton, and means including cooperating elements of said bolt and said trigger for holding said turnbutton in said open position until said trigger is moved away from said turnbutton.

4,125,283

COLLATOR UNLOADER

E. L. Goodwin, Arlington Heights, Ill., assignor to Addressograph Multigraph Corporation, Los Angeles, Calif.

Filed Jun. 30, 1977, Ser. No. 811,790
Int. Cl.[2] B65G 7/12
U.S. Cl. 294—87 R **4 Claims**

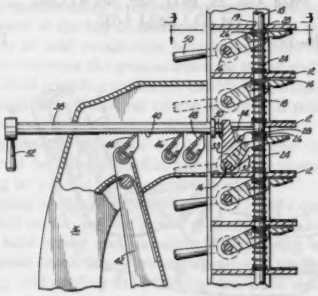
1. A multiple grip unloader for removing paper stacks from a multiple compartment bin unit, comprising:

an elongated frame;

a plurality of pairs of gripper arms, each pair having one arm secured to the frame and the other arm movable relative to the frames;

said pairs each terminating at the extremities in cooperating gripper configuration;

a ratchet drive means with a pistol grip handle and finger operated lever for manual operation;



a gang interconnecting means for driving said movable arms in unison; and

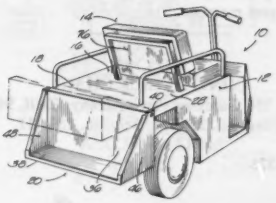
means for transfer of drive from said ratchet drive means to said gang interconnecting means.

4,125,284

VEHICLE WITH CONVERTIBLE STEP AND FOOT REST

John E. Hicks, and Ronald M. Stolley, both of Lincoln, Nebr., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 28, 1977, Ser. No. 772,530
Int. Cl.[2] B62D 33/02
U.S. Cl. 296—62 **8 Claims**



1. A vehicle comprising a vehicle frame having a rear stationary, generally flat first platform, a movable floor section including a generally flat second platform, a wall member extending generally perpendicularly to said second platform, said second platform and said wall member having opposite side edge portions, and a pair of side panels respectively extending generally perpendicularly from said second platform and said wall member side edge portions, means supporting said movable floor section from said vehicle frame for pivotal movement of said movable floor section relative to said first platform between a raised position wherein said first and second platforms are generally coplanar and a lowered position wherein said second platform extends downwardly from and generally perpendicularly to said first platform, and means for releasably supporting said movable floor section in the raised position.

4,125,285

TWO PIECE MOTORCYCLE SEAT FRAME CONSTRUCTION

Michael W. Hanagan, Somers, Conn., assignor to Corbin Gentry, Inc., Somersville, Conn.

Filed Aug. 25, 1977, Ser. No. 827,542
Int. Cl.[2] B62J *1/00*
U.S. Cl. 297—195 **11 Claims**

1. In a motorcycle seat, the combination comprising:

A. a metallic base extending generally in a horizontal plane and having a top wall and a sidewall extending generally downwardly therefrom, said base having forward and rearward ends and including means for attachment to a motorcycle frame;

B. a metallic back rest member at the rearward end of said base and having a horizontal portion extending forwardly along said top wall of said base and an upstanding portion extending upwardly from the rearward end of said base;

C. a pair of transversely spaced, parallel extending support rods having a generally horizontally extending portion extending forwardly along said top wall of said base and said horizontal portion of said back rest member, said rods also having a generally upwardly extending portion extending along the forward face of said back rest member upstanding portion;

D. means securing said rods and said back rest member to each other and to said top wall of said base; and

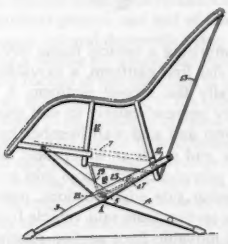
E. cushion means on said base and back rest member including resilient material on the upper surface of said base and the forward surface of said back rest member, and a cover extending over said cushion means on said base and over said back rest member.

4,125,286

CONVERTIBLE CHAIR

Ray H. Redel, 756 Gateview Ave., Albany, Calif. 94706

Filed Jul. 2, 1971, Ser. No. 159,411
Int. Cl.[2] A47C *3/20*
U.S. Cl. 297—325 **5 Claims**



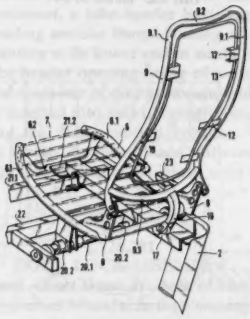
1. A chair convertible from an upright type having a seat and a backrest, to a reclining type in which the seat is at a greater angle to the horizontal and the backrest is at a greater angle to the vertical, in each instance with respect to said chair in its upright position, said chair comprising a pair of X-frames each providing a front leg and a rear leg pivotally connected together at an intermediate point in each, with said rear leg from said pivot point to its lower end being longer than the corresponding portion of said front leg, whereby a spreading of said legs will cause said seat to tilt to a greater angle with respect to the horizontal, and said backrest to a greater angle with respect to the vertical, means for converting said chair from an upright position to a reclining position and vica-versa, and means for stabilizing said chair in each of said positions, said stabilising means including a cross bar interconnecting said front legs of the X-frames, and cross bar engaging means supported below said seat in position to differently engage said cross bar in accordance with the prevailing position of said seat.

4,125,287

SEAT FOR VEHICLES

Heinz Paulisch, Eisenbahnstrasse 17, 8770 Lohr am Main, Germany

Filed Feb. 23, 1977, Ser. No. 771,338
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1976, 2607192
Int. Cl.[2] B60N *1/02*
U.S. Cl. 297—344 **7 Claims**



1. In a seat for vehicles, especially busses, having an upholstered seat to which a backrest is hinged and which may be tilted and adjusted by means of an adjustment lever, the improvement comprising:

a seat frame assembly having side frame members and springs attached under tension between said side frame members, upholstery for the seat, a backrest frame assembly and backrest upholstery;

a support frame having a transverse cylindrical guide and a guide having a flat upper surface spaced from and substantially parallel to said cylindrical guide; and

said seat frame assembly having a sleeve slidably embracing said cylindrical guide and a bearing member slidably supported by said flat upper surface, wherein said flat upper surface is on a square tube attached to said support frame, which is embraced by a U-shaped guide member attached to the seat frame assembly and comprising said bearing member.

4,125,288

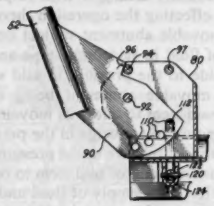
RECLINING SEAT

George T. Hunter, Rte. 3, Box 250, Howe, Ind. 46764

Filed Sep. 14, 1977, Ser. No. 833,019
Int. Cl.[2] A47C *1/026*
U.S. Cl. 297—369 **11 Claims**

1. A reclining seat comprising a seat section, a back section disposed along the rear edge of said seat section, pivot means connecting said back section to said seat section for reclining said back section relative to said seat section, spring means for urging said back section forwardly on said pivot means, and a

latch mechanism on one side of said seat and back sections for retaining said back section in one of several positions, said mechanism including a fixture attached to said back section near said pivot means and movable forwardly and rearwardly as said back section pivots forwardly and rearwardly and containing a plurality of openings with the edges thereof forming shoulders spaced in the forward and rearward direction, and means on said seat section including a finger along the side of said seat section and said fixture for engaging said shoulders to retain said back section in a selected position, means con-



necting said finger to said seat section for releasably retaining said finger in latching position with said shoulders on said fixture, means for releasing said finger from said shoulders when an adjustment in the angular position of said back section is to be made, and a releasable means operatively interconnecting said fixture and the means on said seat section for determining the forward extent of the angular movement of said back section and, when released, said releasable means permitting said back section to pivot forwardly to a position where the tension on said spring is reduced substantially to zero.

4,125,289

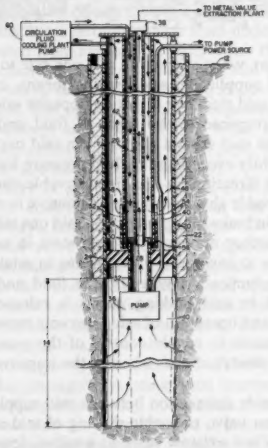
METHOD FOR IN SITU MINEFIELDS

Ray V. Huff, Thatcher, Ariz., and Donald H. Davidson, Bedford, Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Division of Ser. No. 736,301, Oct. 28, 1976, abandoned. This application Dec. 23, 1977, Ser. No. 864,145

Int. Cl.[2] E21B *43/00*

U.S. Cl. 299—4 **3 Claims**



1. A method for cooling pregnant liquor being flowed to a metal value extraction plant through a production hole of an in situ minefield comprising the following steps:

a. providing an injection hole for said in situ minefield;

b. providing at least one production hole for returning liquid leach liquor injected through said injection hole to the surface, said production hole extending from the surface to a leaching interval, each production hole including a casing extending to said interval, a production tube string disposed concentrically within said casing and extending to said leaching interval, a circulation tubing string disposed concentrically about said production tube string and concentrically within said casing, and a packer means disposed at the top of said leaching interval to isolate the region of said production hole in said interval from the region between the production tube string and said casing and, fluid coupling means for establishing a fluid flow path through the circulating tubing string at a point near the packer;

c. pumping the pregnant leach liquor from the leaching interval below the packer through the production tube string to a metal value extraction plant;

d. pumping a circulating cooling fluid from a cooling plant located on the surface to the space between said production tube string and circulating tube string to cool the pregnant leach liquor travelling up said production tube string, said cooling fluid flowing down the space between the production tube string and the circulation tube string to a point near the packer and through the circulation tube string to flow up the production hole and the space between the circulation tube string and the casing; and,

e. delivering said cooling fluid to a cooling plant to cool the cooling fluid to a predetermined value, said predetermined value being selected to provide sufficient heat exchange in the production hole to substantially reduce the requirement for surface heat exchangers prior to ion exchange of the metal values in the pregnant liquor.

4,125,290

VEHICLE LOAD-CONTROLLED BRAKE PRESSURE REGULATING VALVE DEVICE

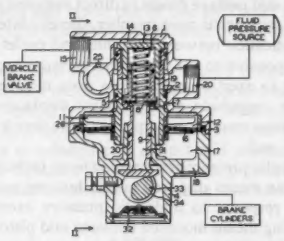
Erich Reinecke, Burgdorf, and Helmut Ulrich, Springe, both of Fed. Rep. of Germany, assignors to WABCO Westinghouse GmbH, Hanover, Fed. Rep. of Germany

Filed Aug. 11, 1977, Ser. No. 823,779

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1976, 2643296

Int. Cl.[2] B60T *8/22*

U.S. Cl. 303—22 R **7 Claims**



1. A vehicle load-controlled brake pressure regulating valve device for fluid pressure operable brake systems, said regulating valve device including a relay valve portion having a first control chamber for controlling delivery of fluid pressure from a fluid pressure source to brake cylinders and a vehicle load-responsive portion for controlling operation of the relay valve portion, said relay valve portion having a relay piston subjectable to actuating brake pressure in said first control chamber supplied thereto via a brake valve, and a valve member carried by the relay piston and actuated thereby to an open position for effecting said delivery of fluid pressure to said brake cylinders in response to said actuating brake pressure when sufficient for overcoming opposing compressive force of a biasing spring also acting on the relay piston, the compression of said spring being varied by the position of a hollow rod member of said load-responsive portion interconnected between said relay piston and a load lever positionally adjustable in accordance

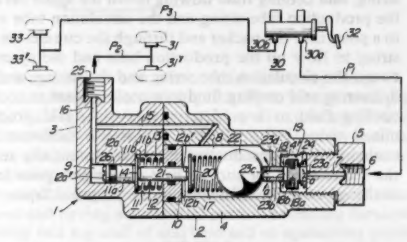
with vehicle load, said rod member being engageable with said valve member for effecting operation thereof to an exhaust position in which fluid pressure is released from the brake cylinders upon reduction of fluid pressure in said control chamber, said relay valve portion and said vehicle-load responsive portion comprising a unitary brake pressure regulating valve device disposed in a common housing.

4,125,291

HYDRAULIC BRAKE PRESSURE CONTROL APPARATUS FOR USE WITH A VEHICLE

Tomoyuki Nogami, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 14, 1977, Ser. No. 815,834
Claims priority, application Japan, Nov. 16, 1976, 51-137547
Int. Cl.[2] B60T *13/06*
U.S. Cl. 303—24 F **8 Claims**



1. A hydraulic pressure control apparatus for use with a vehicle comprising:

a housing having an inlet and outlet openings for a hydraulic pressure medium;

passage means formed in said housing and normally communicating said inlet and outlet opening;

an inertia mass member disposed in said housing and displaceable in response to the deceleration of said vehicle;

means operatively associated with said inertia mass member to close said passage means in direct response to the movement of said inertia mass member, thereby interrupting the communication between said inlet and outlet openings;

means responsive to the hydraulic pressure applied to said housing to exert on said inertia mass member a force of variable magnitude acting against displacement of said inertia mass member in response to the deceleration of the vehicle; and

said hydraulic pressure responsive means including differential piston means disposed in said housing and being slidable in response to hydraulic pressure exerted thereon, and spring means mounted between said piston means and said inertia mass member.

4,125,292

CONTROL VALVE DEVICE WITH SERVICE AND EMERGENCY LIMITING VALVES

Robert J. Worbois, N. Huntingdon, and Richard F. Balukin, Penn Hills, both of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Oct. 11, 1977, Ser. No. 840,888
Int. Cl.[2] B60T *15/52*
U.S. Cl. 303—36 **35 Claims**

1. A fluid pressure controlled vehicle brake apparatus comprising, in combination:

(a) a brake pipe, variations of the fluid pressure in which are effective to control brake applications and brake releases on the vehicle,

(b) a first reservoir normally charged to a chosen pressure,

(c) a second reservoir,

(d) fluid pressure operated braking means for effecting a brake application on the vehicle,

(e) a fluid pressure operated brake control valve device comprising:

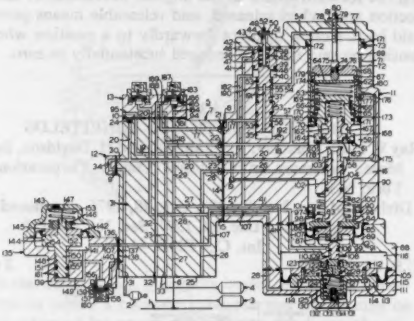
(i) valve means having a supply valve and an exhaust valve operable to effect the supply of fluid under pressure from said first reservoir to said fluid pressure operated braking means and the release of fluid under pressure from said fluid pressure operated braking means to atmosphere,

(ii) a stem coaxially arranged with respect to said valve means for effecting the operation thereof,

(iii) a first movable abutment subject on one side to the pressure of fluid in said brake pipe and subject on the opposite side to the pressure in said second reservoir, said first movable abutment being operatively connected to said stem to effect its movement in one direction in response to a change in the pressure on one side of said abutment relative to the pressure on the opposite side to cause one end of said stem to operate said valve means to effect the supply of fluid under pressure from said first reservoir to said braking means to cause a brake application on the vehicle,

(iv) reservoir pressure control valve means carried on and so operable by said first movable abutment in response to changes in brake pipe pressure as to control the pressure in said second reservoir,

(v) a second movable abutment so connected to said valve



stem as to, when subject on said one side to fluid under pressure supplied to said braking means, effect movement of said stem in a direction opposite said one direction in response to the force of fluid under pressure acting on said second abutment in said opposite direction slightly exceeding the fluid pressure force acting in said one direction on said first movable abutment, said first movable abutment being responsive to a subsequent change in brake pipe pressure on said one side thereof to effect further movement of said stem in said opposite direction to cause said valve means to establish a venting communication whereby the fluid under pressure supplied to said braking means is released to atmosphere, and operation of said reservoir pressure control valve means to enable control of the pressure in said second reservoir, and wherein the improvement comprises:

(f) a lost-motion connection between said supply valve and said exhaust valve to enable shifting of said supply valve relative to said exhaust valve to a valve closed position,

(g) means for subjecting said supply valve to the fluid under pressure supplied to said braking means, and

(h) biasing means for subjecting said supply valve to a force acting in a valve-closing direction whereby said biasing force acts cojointly with the fluid under pressure supplied to said braking means to effect shifting of said supply valve to a valve closed position to cut off flow of fluid under pressure to said braking means thereby limiting the

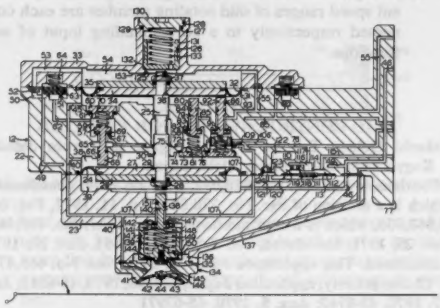
degree of pressure supplied to said braking means in accordance with the strength of said biasing means.

4,125,293

EMERGENCY PORTION FOR BRAKE CONTROL VALVE

James E. Hart, Trafford, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Oct. 5, 1977, Ser. No. 839,719
Int. Cl.[2] B60T *15/30*
U.S. Cl. 303—37 **10 Claims**



1. For use in a brake apparatus including a brake pipe, an auxiliary reservoir and an emergency reservoir each normally charged to a certain chosen pressure, a brake cylinder and a fluid-pressure-operated service valve device, a fluid-pressure-operated emergency valve device operative in conjunction with said service valve device in response to a reduction of the pressure in the brake pipe at an emergency rate to effect the supply of fluid under pressure from said reservoirs to said brake cylinder to cause an emergency brake application, said emergency valve device comprising:

(a) a casing having therein a plurality of chambers, bores and passageways, one of said bores having coaxial therewith a pair of counterbores of unequal diameter whereby a shoulder is formed therebetween, said one bore and a first one of said plurality of passageways cooperating to provide a communication through which fluid under pressure may be released from another chamber other than said plurality of chambers to atmosphere via said pair of coaxial counterbores, said one bore having at one end an annular valve seat, and one end of said passageways opening into said chambers and bores and the other end being connected respectively to the brake pipe, the emergency reservoir and said another chamber,

(b) a plurality of poppet-type valves, each having a fluted stem, for controlling flow between said chambers and passageways, one of said poppet-type valves being a double seated valve having a pair of spaced-apart annular members carried thereon, one of which cooperates with said annular valve seat at said one end of said one bore to control flow between said another chamber and said coaxial counterbores at the wall surface of which larger counterbore opens, one above the other, one end of two other of said passageways, the other end of the lower one of said two other passageways being open to atmosphere,

(c) an annular piston having on one side thereof an annular valve seat and carrying thereon a pair of spaced-apart seals for sealing engagement with the wall surface of said larger counterbore in which said annular piston is slidably mounted,

(d) a pair of springs of unequal strength, the ligher of which is interposed between said one side of said piston and said one double seated poppet-type valve for normally biasing said one annular member carried on said one valve into seating engagement with said annular valve seat at said one end of said one bore, and the heavier of which is interposed between the other side of said piston and said casing to normally bias said piston against said shoulder,

(e) a pair of chokes of unequal diameter, the larger of which is so disposed as to control the rate of flow of fluid under pressure between the interior of said larger counterbore and said lower of said two other passageways and the smaller of which is so disposed as to control the rate of flow of fluid under pressure from the upper to the lower of said passageways in bypass of said larger choke,

(f) movable abutment means subject respectively to pressure in the brake pipe and in said another chamber, the deflection of said abutment means a first chosen degree in one direction responsive to a reduction of the pressure in the brake pipe at a service rate being effective to cause said abutment means to effect unseating of said one annular member carried by said double seated valve from said annular valve seat at said one end of said one bore against the yielding resistance of said lighter spring, without effecting seating of the other of said pair of annular members carried by said double seated valve on said annular valve seat on said one side of said annular piston, to cause the release of fluid under pressure from said another chamber to atmosphere via said one bore, said smaller counterbore, said annular piston, said larger counterbore, said larger choke and said lower one of said two other passageways at a rate determined by the diameter of said larger choke, and the deflection of said abutment means a second chosen degree, which is greater than said first chosen degree, in said one direction responsive to a reduction of the pressure in the brake pipe at an emergency rate being effective to cause said abutment means to effect seating of said other of said pair of annular members carried by said double seated valve on said annular valve seat on said one side of said annular piston and thereafter shifting of said piston against the yielding resistance of said stronger spring, to a position in abutting relationship with said casing, in which position said pair of seals carried by said piston form seals with the wall surface of said larger counterbore below said one end of the upper one of said two other passageways, to cause the release of fluid under pressure from said other chamber to atmosphere via said one bore, said smaller and larger counterbores, the upper one of said two other passageways, said smaller choke, and said lower one of said two other passageways at a rate determined by the diameter of said smaller choke, and

(g) resilient means effective to yieldingly resist deflection of said abutment means in a direction opposite said one direction is response to the pressure in the brake pipe exceeding that in said another chamber, said resilient means being effective to subsequently deflect said abutment means in said one direction responsive to the pressure in said another chamber increasing to that in said brake pipe.

4,125,294

FLUID PRESSURE CONTROL VALVE DEVICE ARRANGED FOR FAIL-SAFE OPERATION

John G. Cannon, Penn Hills, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Nov. 9, 1977, Ser. No. 849,821
Int. Cl.[2] B60T *15/30*
U.S. Cl. 303—37 **8 Claims**

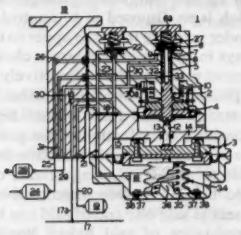
1. A proportioning-type control valve device for controlling the fluid pressure in a brake cylinder device in accordance with variations of fluid pressure carried in a brake pipe comprising:

(a) valve means controlling the supply and release of the brake cylinder fluid pressure;

(b) one-way check valve means for connecting the brake pipe pressure to a control reservoir when the brake pipe pressure exceeds the control reservoir pressure and for preventing the back-flow of the control reservoir pressure to the brake pipe;

(c) a piston assembly for operating said valve means includ-

ing an actuating piston abutment subject on one side to the brake pipe pressure and on the opposite side to the control reservoir pressure, said actuating piston abutment being operative responsive to a brake pipe pressure reduction to accordingly move said piston assembly to a service posi-



tion in which said valve means supplied fluid pressure to the brake cylinder device; and

(d) spring means for effecting movement of said piston assembly to said service position in the absence of said control reservoir fluid pressure whenever said brake pipe fluid pressure is reduced below a certain chosen value.

4,125,295

DIGITAL SPEED DETECTING CIRCUIT FOR A ROTATING MEMBER HAVING A WIDE SPEED RANGE

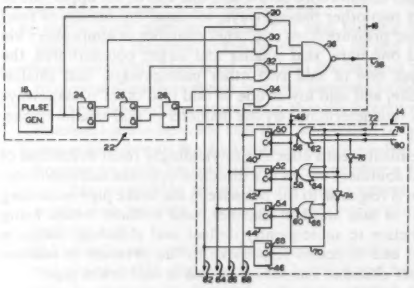
Gerhard Ruhnau, and Wolfgang Gudat, both of Hanover, Fed. Rep. of Germany, assignors to WABCO Westinghouse GmbH, Hanover, Germany

Filed Jul. 27, 1977, Ser. No. 819,312

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1976, 2635004

Int. Cl.[2] B60T *8/02*

U.S. Cl. 303—95 **7 Claims**



1. A digital speed detecting circuit including a sensor device which produces a sequence of sinusoidal signals having a frequency proportional to the speed of a rotating member, a pulse generator having an output frequency greater than the maximum frequency of said sensor signal, and a counter to which the output frequency of said pulse generator is fed to obtain a pulse count representative of the speed of the rotating member during a time interval of a cycle of said sensor signal, wherein the improvement comprises:

(a) a multi-stage frequency divider network to which said pulse generator is connected for providing a plurality of different frequencies of said pulse generator frequency;

(b) a frequency selector circuit including:

(i) a plurality of first NAND gates each having one input subject to the output frequency of a respective stage of said frequency divider network; and

(ii) a second NAND gate to which the outputs of said plurality of first NAND gates are connected, said second NAND gate having an output via which said output frequency from one of said plurality of said first NAND gates is connected to said counter;

(c) speed range detector means for enabling said frequency selector circuit so as to choose said output frequency in accordance with a pulse count registered by said counter during the previous cycle of said sensor signal representative of a certain speed range value of said rotating member comprising:

(i) a plurality of flip-flops, each having an output connected to the other input of a respective one of said plurality of first NAND gates; and

(ii) a logic network via which signals representing different speed ranges of said rotating member are each connected respectively to a corresponding input of said flip-flops.

4,125,296

SKID CONTROL SYSTEM FOR VEHICLES

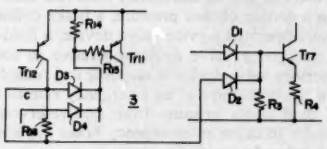
Takeshi Ochiai, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 510,032, Sep. 27, 1974, abandoned, which is a division of Ser. No. 270,584, Jul. 11, 1972, Pat. No. 3,848,933, which is a continuation-in-part of Ser. No. 109,465, Jan. 25, 1971, abandoned, and Ser. No. 109,461, Jan. 25, 1971, abandoned. This application Mar. 23, 1976, Ser. No. 669,477

Claims priority, application Japan, Jan. 26, 1970, 45-6312; Jan. 27, 1970, 45-6743; Aug. 5, 1970, 45-67971

Int. Cl.[2] B60T *8/10*

U.S. Cl. 303—109 **10 Claims**



1. For a vehicle with wheels and a brake, a brake control system for regulating the braking effect of the brake, comprising:

detector means for producing a variable detector signal corresponding to the speed of a wheel, storage means coupled to said dectector means for storing the detector signal and for forming a reference signal representing a momentary reference speed having a changeable maximum variability corresponding to a changeable desired deceleration,

brake modifying means coupled to said detector means and said storage means for comparing the reference signal with said dectector signal and for producing a brake relieving signal when the detector signal and said reference signal have a given relation indicating that the wheel speed has decelerated faster than the given deceleration,

whereby the brake relieving signal decreases the deceleration of the wheel and may cause the wheel speed to be greater than the momentary reference speed,

said dectector means responding to changes in the wheel speed and said storage means responding to said detector means when the wheel speed is greater than the momentary reference speed to produce given changes in the reference signal,

coupling means coupled to the storage means and said brake modifying means for causing the brake modifying means to continue the brake relieving signal during the given changes in the reference signal said coupling means including a transistor coupled to said storage means for responding to the given changes in the storage means and a diode coupling said transistor to said brake modifying means.

4,125,297
UNIVERSAL DRAWER SLIDER

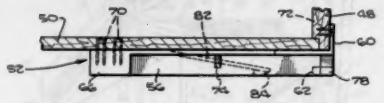
Paul M. Mertes, 15528 Don Metz St., Granada Hills, Calif. 91344

Continuation-in-part of Ser. No. 704,649, Jul. 12, 1976, Pat. No. 4,061,375, which is a continuation-in-part of Ser. No. 576,349, May 12, 1975, abandoned. This application Dec. 5, 1977, Ser. No. 857,234

The portion of the term of this patent subsequent to Dec. 5, 1994, has been disclaimed.

Int. Cl.[2] F16C *21/02*

U.S. Cl. 308—3.6 21 Claims



1. An economical universal drawer slide assembly comprising:

a fixed cabinet guide member having transversely extending side rails, having a predetermined length, having a groove extending for most of its length, said groove terminating in a positive stop near the front of said cabinet guide member;

a drawer having a depth from front to rear substantially equal to the length of said cabinet guide member;

a generally rectangular drawer slide body having a width slightly greater than said cabinet guide member, and a length less than two-thirds of the length of said guide member;

an integral flange extending at right angles from one end of said drawer slide body and overlying the rear of said drawer;

means for securing the front end of said slide body to an intermediate point on the bottom of a drawer;

means for securing the rear of said slide body to the rear of a drawer;

means including two laterally extending members integrally secured to said drawer slide body for engaging the transversely extending side rails of the cabinet guide member at the rear of said drawer slide,

means located along the length of said drawer slide body for engaging the cabinet guide member for maintaining the drawer slide member in alignment with the cabinet guide member; and

a selectively releasable depending hook means integral with said slide body for normally riding in said groove, and for engaging said stop on said cabinet guide, to positively prevent accidental movement of said drawer slide out of engagement with said cabinet guide.

4,125,298
ASSEMBLY OF HARDENED AND DEFORMABLE METAL PARTS

Günther Heurich, and Heinrich Hofmann, both of Schweinfurt, Fed. Rep. of Germany, assignors to Kugelfischer Georg Schafer & Co., Schweinfurt, Fed. Rep. of Germany

Filed Mar. 17, 1977, Ser. No. 778,463

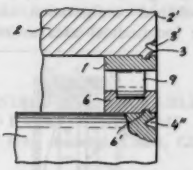
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1976, 2611218

Int. Cl.[2] F16C *13/00, 33/00, 35/00*

U.S. Cl. 308—189 R 8 Claims

1. In a journal bearing including a pair of coaxial annular races of hardened steel separated by a set of rotary bodies, one of said races having a cylindrical surface remote from said bodies, and a supporting element of relatively deformable metal for said one of said races, said supporting element having an annular surface coaxial with said cylindrical surface and in contact therewith,

the improvement wherein said one of said races is formed on said cylindrical surface with a peripheral groove of rectangular cross-section overlain by said annular surface, said groove being occupied over at least part of its length and



over its entire width by metal from said supporting element extruded into same, the extruded metal transmitting axial forces between said element and said one of said races while preventing any relative axial shifting thereof.

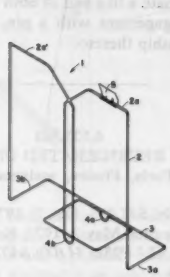
4,125,299
FILE DIVIDER AND INDEXING APPARATUS

Coleman R. Chamberlin, Thompson Ridge, N.Y., assignor to CEL-U-DEX Corp., New Windsor, N.Y.

Filed May 27, 1977, Ser. No. 801,412

Int. Cl.[2] A47B *63/00*

U.S. Cl. 312—184 8 Claims



1. File divider and indexing device comprising in combination: an upright divider and support element adapted to provide support over a predetermined wide area sufficiently to lend support to each of spaced-apart points of a file folder, and base anchor means attached to a base portion of the divider and support element for maintaining the upright divider and support element in an upright state when the upright divider and support element is supporting file material; the upright divider and support element being of a predetermined height sufficient to exceed in height that of normal file folders while receiving upright support from the base anchor means; and indicia-mounting means for providing information relative to file material being supported, and mounted on an upper portion of the upright divider and support element such that indicia thereof is visible above the upper edges of normal file folders.

4,125,300
STORAGE CABINET FOR SKI EQUIPMENT

Bernard J. Putt, Star Route Box 169, Howard, Colo. 81233, and Roger E. Hughet, 5635 Putnam, West Bloomfield, Mich. 48033

Division of Ser. No. 648,905, Jan. 14, 1976, Pat. No. 4,084,867. This application Dec. 19, 1977, Ser. No. 861,956

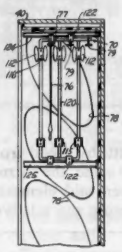
Int. Cl.[2] A47F *7/00*

U.S. Cl. 312—351 5 Claims

1. A storage cabinet for ski equipment having a walled compartment for storing skis in pairs, wherein the invention comprises:

a pair of spaced, curved periphery holding devices, said devices having a pivotal mounting proximate their mid-sections and further having a spacing therebetween of a

size less than the combined width of the two skis proximate their curved tip ends in a back-to-back position, said devices pivotal into holding abutment along a portion of the length of the skis for mounting and holding them securely one against the other; said devices are of an ellipsoidal-shaped configuration, said ellipsoidal devices have their longitudinal axes substantially vertical and



aligned with the longitudinal axes of the skis and wherein a means is provided for limiting the degree of pivotal movement of said devices, said limiting means comprises a hole and arcuate slot arrangement, said arcuate slots formed proimate a like end of both of said devices and in operative engagement with a pin, said pin mounted in fixed relationship thereto.

4,125,301

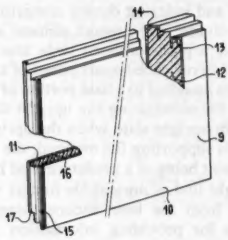
REFRIGERATED UNIT

Chi Quy Phan, Paris, France, assignor to Thomson-Brandt, Paris, France

Division of Ser. No. 547,953, Feb. 7, 1975, Pat. No. 4,044,449. This application May 2, 1977, Ser. No. 792,850

Int. Cl.[2] F25D *11/00;* **A47B** *81/00*

U.S. Cl. 312—214 **7 Claims**



1. A refrigerated unit composed of a plurality of modular insulating elements, each of said elements constituting a fraction of a wall, bottom or upper portion of the unit, each of said elements comprising:

a layer of thermally insulating plastic foam formed in situ and having opposed outer surfaces joined by four edge surfaces, with two opposite edge surfaces formed as multiple step tiers and with the other opposite edge surfaces formed as outwardly extending foam plastic protuberances; and

a pair of opposite wall members attached to a respective one of the opposed outer surfaces, wherein said insulating units are assembled side by side along their edges so as to realize a tight sealing by effecting an intimate contact between the plastic foam stepwise tiers and by compressing the outwardly extending plastic foam protuberances against one another.

4,125,302

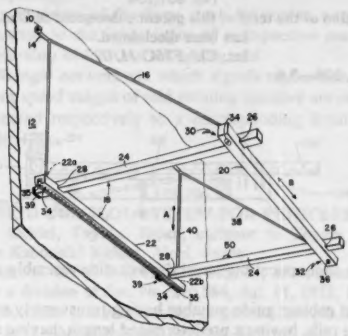
EASY-LEVELING SUPPORT DEVICE

Leigh A. Peritz, 63 Washington St., Winchester, Mass. 01890, and Alan C. Huber, 9 Philemon St., Arlington, Mass. 02174

Filed May 4, 1976, Ser. No. 683,004

Int. Cl.[2] A47B *5/00*

U.S. Cl. 312—242 **1 Claim**



1. An article-support apparatus adapted for hanging from a wall and comprising

a. a support member forming means to provide a horizontal support plane;

b. attachment means including a flexible cord to attach said support member to said wall;

c. said attachment means comprising also (1) a cord-receiving membr adapted to be fixed to said wall and forming means to allow the cord to slide therethrough and (2) a locking member to lock said cord into non-sliding relationship with said cord-receiving member;

c. said cord slideably arranged with respect to said attachment means and said cord-receiving member to form means to tilt it around an axis normal to a wall from which said apparatus is hung, and move said support means to a horizontal position

and wherein said cord follows a path from

a. a first front side position of said support plane,

b. on a diagonal segment backwardly and upwardly toward said wall and through one said attachment means,

c. on a vertical segment, downwardly to one side at a back position of said first side of said support plane,

d. across and under said support plane to a back position of a second side of said support plane,

e. on a diagonal segment, upwardly through another said clamp means and

f. on a diagonal segment downwardly and forwardly to a front position on said second side of said support plane,

and wherein said cord means, when in said released position, forms means to allow the elongation of said diagonally segments and a shortening of said vertical segments of said cord, thereby forming means to move said support member against said wall.

4,125,303

PORTABLE HOUSEHOLD FILE

Maria S. Falkiewicz, 43035 Hanford, Canton Township, Wayne County, Mich. 48187

Filed Sep. 19, 1977, Ser. No. 834,433

Int. Cl.[2] A47B *95/02*

U.S. Cl. 312—244 **5 Claims**

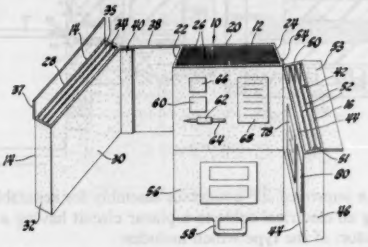
1. A portable household file comprising:

a first container having a pair of parallel, planar long sidewalls connected to a pair of parallel, planar short sidewalls to define a top opening for receiving filed material;

a second container having a pair of parallel, planar long

sidewalls connected to a pair of parallel, planar short sidewalls to define a top opening for receiving filed material;

hinge means connecting the first container and the second container such that said containers are relatively movable between a first position in which the long sidewalls of the first container are parallel to the long sidewalls of the second container, and the top opening of said containers permits removal of filed material from the containers, and a second position in the long sidewalls of the first container are disposed at an angle with respect to the long sidewalls of the second container;



a planar writing panel pivotally connected to the first container so as to be movable between an upper position in which it is disposed parallel to the long sidewalls of the first container and the second container, and a lower writing position in which the panel is disposed at right angles to the sidewalls of the first container and the second container at such times as they are in their second position;

a cover member connected to one of such containers for enclosing the top openings of the first container and the second container in their first position; and

handle means connected to said containers for carrying same.

4,125,304

COLLAPSIBLE CUPBOARD

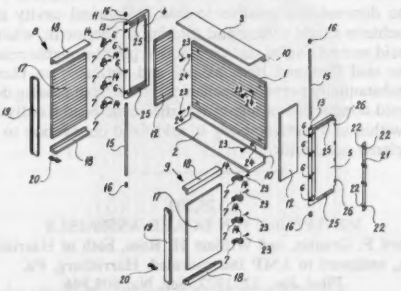
Claus Ebert, Kronberg, Germany, assignor to ISOPOL A.G., Switzerland

Filed May 12, 1977, Ser. No. 796,440

Claims priority, application Switzerland, May 21, 1976, 6469/76

Int. Cl.[2] A47B *47/03*

U.S. Cl. 312—257 SM **10 Claims**



1. A collapsible cupboard for tools, utensils, containers and the like, comprising; a rear wall having a front face which has top and bottom edges, and having, disposed along each of the edges, a horizontal groove; two horizontal shelves, having edge portions extending therefrom and receivable detachably in the horizontal grooves to fully support the shelves; and sidewalls detachably attachable to the rear wall at right angles from the outside thereof and similarly attachable to the shelves, the sidewalls having recesses at front vertical edges thereof for detachably receiving hinge elements for leaves of a door; whereby the walls and shelves can be collapsed into a dismantled state, saving a substantial part of space which they occupy when attached to one another, and thereby simplifying their handling, shipping and storage.

4,125,305

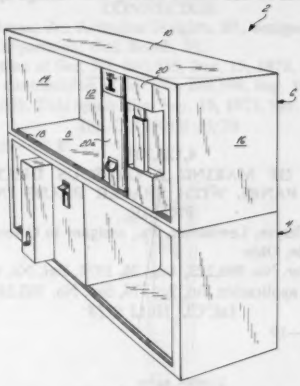
READILY ACCESSIBLE AND LOCKABLE STORAGE AND PACKAGE SYSTEMS

Robert I. Kasindorf, Five Ashleigh Court, Glen Cove, N.Y. 11452

Filed Jul. 26, 1976, Ser. No. 708,966

Int. Cl.[2] A47B *81/00*

U.S. Cl. 312—320 **6 Claims**



1. A storage system comprising, in combination, a box-like compartment having top and bottom walls, opposite side wall means and an open front and a plurality of items receivable in said compartment and disposable on said bottom wall in side by side relationship to be removable individually and independently through said open front and to be movable along said bottom wall in the direction from one side wall to another and across said bottom wall transversely to said direction, a groove extending longitudinally along the entire length of the interior surface of at least one of said top and bottom walls and extending across the same between said side walls, at least one of said items comprising a body and a bolt element movable relative to that body and into and from said groove, said at least one of said items having a height only slightly less than the spacing between said top and bottom walls whereby said bolt element, when projected into said groove, constitutes means to prevent inadvertent removal of said item from said compartment.

4,125,306

SPIKED LOW-VOLTAGE AGING OF CATHODE-RAY TUBES

John T. Coble, Marion, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 17, 1977, Ser. No. 852,449

Int. Cl.[2] H01J *9/44*

U.S. Cl. 316—1 **4 Claims**

1. A method for processing a sealed cathode-ray tube comprising an evacuated envelope and, positioned therein, an electron gun including a cathode and a heater for said cathode, said method including the steps of:

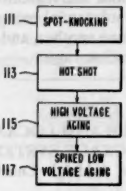
(a) spot knocking

(b) hot shot and

(c) low-voltage aging

characterized in that, during low voltage aging, at least three voltage spikes are applied to said heater, said voltage spikes

being at least three minutes apart, each voltage spike having a peak of at least 9.0 volts and lasting for a time period of up to



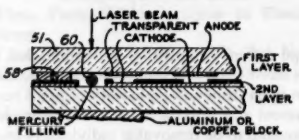
120 seconds and having a voltage peak that is higher than the voltage applied to said heater during low-voltage aging.

4,125,307

METHOD OF MAKING A GASEOUS DISCHARGE DISPLAY PANEL WITH SPACER BEADS IN SEAL FRAME

Stephen C. Thayer, Lewistown, Pa., assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 500,225, Aug. 26, 1974, Pat. No. 4,001,629. This application Jul. 7, 1976, Ser. No. 703,161
Int. Cl.[2] H01J *9/18*
U.S. Cl. 316—19 **1 Claim**



1. A method for making a gaseous discharge display device having an electrode substrate, a viewing plate substrate, a frame sealing said electrode substrate and viewing plate substrate to form a sealed volume, a gaseous medium within said sealed volume; and cathode and anode electrodes within said sealed volume arranged to selectively excite the gas adjacent thereto to form a visual display; said process comprising the steps of:

(a) printing at least some of said electrodes in situ on said electrode substrate using conductive inks capable of being fired at a temperature below the melting point of the substrate,

(b) applying a dielectric layer over at least a portion of said electrode substrate and the electrodes printed thereon,

(c) printing on one of said substrates a seal frame composed of a fusible glass frit and dimensionally uniform spacer beads,

(d) assembling said electrode substrate and viewing plate substrate in spaced relation with said seal frame in contact therewith to form an assemblage, said seal frame having spaced apart ends providing an opening for vacuumization and gas insertion,

(e) heating said assemblage to fuse said frame and thereby join said substrates in spaced apart relation to form said sealed volume,

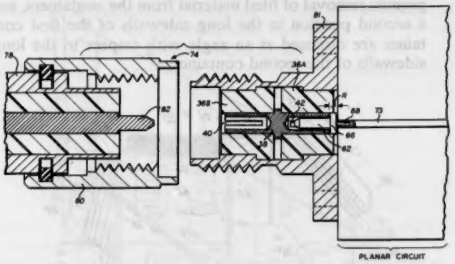
(f) inserting said gas in said volume and confining same therein at a selected discharge pressure.

4,125,308

TRANSITIONAL RF CONNECTOR

William A. Schilling, Hightstown, N.J., assignor to EMC Technology, Inc., Cherry Hill, N.J.

Filed May 26, 1977, Ser. No. 800,861
Int. Cl.[2] H01R *17/04*; H05K *1/04*
U.S. Cl. 339—17 LC **6 Claims**



1. An improved RF connector assembly for separably connecting an electrical cable to a planar circuit having a planar conductor, of the type which includes:

(a) a first connector part which is fixedly attachable to said cable; and

(b) a second connector part which includes a metallic body, a dielectric bead having a body end and a conductor end, and a conductive pin having first and second ends, said second connector part being detachably connectable to said first connector part, said metallic body including means for fixedly mounting said second connector part onto said planar circuit, said body end of said dielectric bead being fixedly held within said metallic body, said conductive pin being fixedly held at said first end within said dielectric bead and being of such a length between said ends that said second end abuts said planar conductor when said second connector part is fixedly mounted onto said planar circuit, said second end being formed for fixed connection to said planar conductor, and the length of said dielectric bead between said body and conductor ends being such that said conductor end is adjacent said planar conductor when said second connector part is so fixedly mounted; wherein the improvement comprises:

a detachably connectable and electrically conductive joint in said conductive pin between said first and second ends, said joint including a first side and a second side, said first side defining a cylindrical cavity, and said second side including a mating cylindrical portion, both sides being located within said dielectric bead, said second side being so dimensioned relative to said cylindrical cavity as to achieve a tight sliding and rotating fit therewith, whereby said second end of said conductive pin is movable relative to said first end both axially and rotatably to thereby substantially prevent mechanical stress from passing down said conductive pin from said dielectric bead fixedly held within said metallic body to said fixed connection to said planar conductor.

4,125,309

MINIATURE PIN BOARD ASSEMBLY

Richard F. Grantiz, and William H. Rose, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 22, 1977, Ser. No. 808,846
Int. Cl.[2] H01R *29/00*
U.S. Cl. 339—18 P **4 Claims**

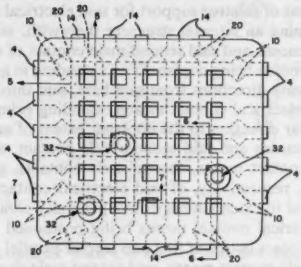
1. In a miniaturized pin board assembly having a first row of elongate conductors overlaid by a second row of elongate conductors and means for connecting a selected conductor of said first row with a selected conductor of said second row, the improvement comprising:

said first and second rows of conductors being embedded in

an elastomeric substrate and being maintained in spaced relationship by said substrate;

said substrate being provided with a matrix of openings, each of said openings communicating with an edge margin of a conductor of said first row and also an edge margin of a conductor of said second row, and

said means comprises one or more conductive pins provided with enlarged heads, each pin being inserted in a selected opening,



said substrate yielding elastically to expand said selective opening in response to receipt therein of one said corresponding pin, said substrate having within each said opening a pin engaging portion which partially defines said opening, said pin engaging portion elastically engaging said inserted pin continuously the length thereof and partially therearound opposite corresponding edge margins to laterally force said respective pin against said corresponding edge margins of said conductors to establish and maintain electrical contact between said pin and said conductors.

4,125,310

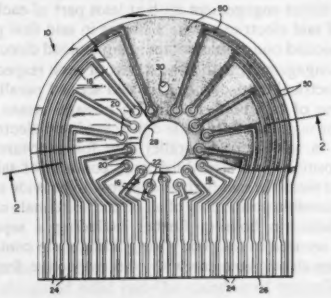
ELECTRICAL CONNECTOR ASSEMBLY UTILIZING WAFERS FOR CONNECTING ELECTRICAL CABLES

Patrick A. Reardon, II, deceased, late of Los Angeles, Calif., and by Jeanne A. Reardon, administratrix, 17310 Trosa St., Los Angeles, Calif. 91344

Filed Dec. 1, 1975, Ser. No. 636,514

Int. Cl.[2] H01R *13/54*; H05K *1/12*

U.S. Cl. 339—92 M **11 Claims**



1. An electrical connector assembly comprising:

a first wafer having a surface and means on said surface for defining a pattern of first contact pads terminating first electrical conductors;

a second wafer having a surface contiguously mateable with said first wafer surface and means on said second wafer surface for defining a pattern of second contact pads terminating second electrical conductors having positions which mirror those of said pattern of first contact pads for enabling electrical contact between said electrical conductors of said first and second wafers;

means for securing said wafers together under pressure in the electrical contact and in a pre-selected orientation of said patterns of said first and second contact pads; and

buttons terminating said contact pads of said first wafer and extending from and above the surface of said first wafer, said buttons comprising conductive material having plastic memory and resiliently contacting said second contact pads, the pressure exerted by said securing means on said wafers not exceeding the limit of the collective plastic memory of said buttons for maintaining the spring resiliency of said buttons.

4,125,311

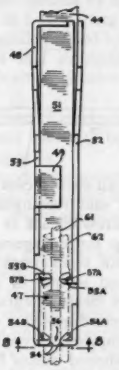
INSULATION-PIERCING CONTACT MEMBER AND CONNECTOR

Paul P. Hoppe, Jr., Arlington Heights, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 640,535, Dec. 15, 1975, abandoned, which is a continuation of Ser. No. 288,998, Sep. 14, 1972, Pat. No. 3,926,498. This application Sep. 19, 1977, Ser. No. 834,787

Int. Cl.[2] H01R *13/38*

U.S. Cl. 339—97 R **6 Claims**



1. A contact member including a terminal element with two transversely opposed channel walls and at least one pair of opposed and transversely disposed flange elements carried by said walls, and an upwardly opening, insulation-piercing notch formed by said flange elements disposed within a conductor portion between said walls for receivng an insulation-covered metallic conductor inserted downwardly into the notch, the notch including upwardly disposed portions for spreading the insulation of the conductor and lower portions with wiping surfaces for engaging the conductor and at least one tab integrally and upwardly joined to one of said walls within said conductor portion in a location dispoed longitudinally from said pair of flange elements and extending transversely above and engaging said insulated conductor fo retaining said conductor in said conductor portion.

4,125,312

CONNECTOR FOR ELECTRICAL APPARATUS

Michele Aimar, Turin, Italy, assignor to ITW Fastex Italia, S.p.A., Turin, Italy

Filed Jun. 27, 1977, Ser. No. 810,324

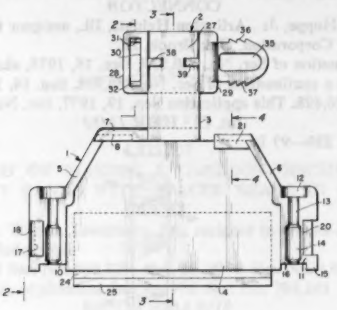
Claims priority, application Italy, Jul. 5, 1976, 25013 A/76

Int. Cl.[2] H01R *13/58*

U.S. Cl. 339—107 **8 Claims**

1. A two-piece insulated connector housing and strain relief means adapted to accept a metallic electrical connector having an apertured flange means substantially surrounding a cup-

shaped prong contact protector and axially extending cable means, said housing including a pair of substantially identical half-shells having integral means for snap-retaining said half-shells in assembled insulated surrounding relationship to said connector and strain relief relationship to said cable, each half-shell including a base having a front rectangular portion and a rear trapezoidal portion connected with the longitudinal axis of said housing lying perpendicular to the major dimension of said portions to the rectangular portion, wall means extending normally from said base along the narrow dimensions of said rectangular portions and a substantial portion of the lateral margins of said trapezoidal portion except for a medially disposed section lying on the axis of said shell, resilient engaging means extending normally from one end of said rectangular portion, complementary shoulder means at the opposite end of said rectangular portion for accepting the resilient engaging



means of the second half-shell, recess means in each wall means at opposite ends of said rectangular portion of said base adapted to accept screw means in axially restrained freely rotatable relationship for engagement with said apertured flange of said connector, strap means extending integrally from said medially disposed section of said trapezoidal portion, U-shaped strain relief means integral with said strap, second resilient engaging means disposed in one wall of said U-shaped means and second complementary shoulder means in the opposite wall of said U-shaped means for accepting the second resilient engaging means of the second half-shell, recessed groove means along a substantial portion of the unwalled free edge of said rectangular portion opposite the trapezoidal portion for accepting said flange of said connector in restrained relation, interlocking means in said wall adjacent said medially disposed section of said trapezoidal portion for locking said wall in locked encasing relation around said connector.

4,125,313

ELECTRICAL CONNECTION DEVICE

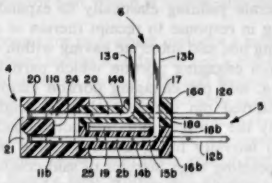
Steven O. Sipp, Painesville; Gary M. Schmidt, Cleveland, and John T. Venaleck, Painesville, all of Ohio, assignors to A P Products Incorporated, Painesville, Ohio

Continuation of Ser. No. 653,476, Jan. 29, 1976, abandoned. This application Oct. 25, 1977, Ser. No. 845,228

Int. Cl.[2] H01R *13/02*

U.S. Cl. 339—176 M **5 Claims**

1. An on-line electrical connector for simultaneously electrically connecting a first plurality of electrical circuits that terminate at respective electrical contacts of at least one multiconductor electrical cable termination, cable termination assembly, or like device to respective ones of a second plurality of electrical circuits of another such device, comprising a plurality of electrical contact means connectable to the respective electrical contacts for simultaneously electrically connecting the first plurality of electrical circuits to respective ones of the second plurality of electrical circuits, each electrical contact means including a base, first female contact means, a second male contact, and a third male contact as respective contacting parts configured and relatively accessibly positioned for mechanical and electrical connection with respective electrical contacts of such respective devices, or the like, and a dielectric housing comprised of a body of dielectric material molded directly to and in surrounding engagement with at least part of each respective base of said plurality of electrical contact means to secure said electrical contact means in relatively fixed, electrically isolated positions with at least a portion of each of said contacting parts being exposed from said body for such electrical connection, said body being the sole means of relative support for said electrical contact means and forming an integral structure therewith, said first female contact means and said second male contact of each electrical contact means being coplanar and extending in generally parallel, opposite directions from said base, said third male contact of each electrical contact means extending primarily in a perpendicular direction to the coplanar extent of said first female contact means and said second male contact, all of said first female contact means, second male contacts, and third male contacts, respectively, of said electrical contact means being positioned to extend in respective generally parallel directions, said electrical contact means being positioned with their respective bases in one of first and second parallel rows, and said first female contact means, said second male contacts, and said third male contacts also being positioned in respective pairs of



parallel rows in dual-in-line configuration to form, respectively, first, second, and third connecting portions, said second parallel row of electrical contact means being located in said body more remote from the accessible portion of said third male contacts than said first parallel row of electrical contact means, each of said electrical contact means in said second parallel row further comprising extension means for connecting said third male contact thereof with said base relatively off-set from the third male contact of said electrical contact means in said first parallel row, said body comprising a plurality of bodies, a first one of said bodies being molded directly to and in direct engagement with at least part of each respective base of said electrical contact means in said first parallel row and a second one of said bodies being molded directly to and in direct engagement with at least part of each respective base of said electrical contact means in said second parallel row, said first one of said bodies including passage means for passing therethrough said third male contacts of said electrical contact means in said second parallel row for exposure in parallel juxtaposition with said third male contacts of said electrical contact means in said first parallel row to provide such dual-in-line accessible positioning of all of said third male contacts, and said dielectric housing further including a separate cover means secured to said body for guiding male contacts of such a device to engagement with said respective female contact means.

4,125,314

BEAM RATIO CONTROL FOR HOLOGRAPHY

Richard E. Haskell, and Ralph M. Grant, both of Rochester, Mich., assignors to Dr. Ralph M. Grant Engineering Consultants, Inc., Auburn Heights, Mich.

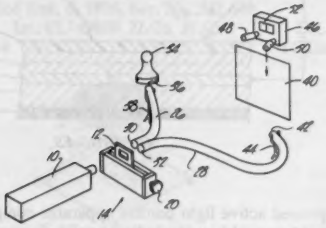
Filed May 5, 1977, Ser. No. 794,059

Int. Cl.[2] G03H *1/02*

U.S. Cl. 350—3.60 **5 Claims**

1. An apparatus for forming a hologram of an object on a

photographic media, including a source of coherent light, a first object optical beam path from said source to said object, and a second reference beam optical path from said source to said media, the improvement comprising: a first elongated bundle of optically conductive fibers having one end supported adjacent the coherent light source and arrayed so as to form one of said optical paths; a second distinct elongated bundle of optically conductive fibers having a first end adjacent to and coplanar with the end of the first optical fiber bundle which is adjacent the light source and having a second end arrayed so that the second fiber bundle forms the other of the optical paths; an adjustable aperture mask supported between the coherent light source and the first ends of said first and second fiber bundles; and means for adjusting said aperture to modify the ratio of light quantities that fall on the ends of the first and second optically conductive fiber bundles.

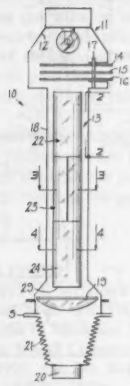


4,125,315

LIGHT MIXING DEVICE

Richard M. Altman, Woodland Hills, and Ravindra K. Badkar, Los Angeles, both of Calif., assignors to Vivitar Corporation, Santa Monica, Calif.

Filed Jul. 28, 1976, Ser. No. 709,459
Int. Cl.[2] G02B *5/14*; G03B *27/00*
U.S. Cl. 350—96.10 **21 Claims**



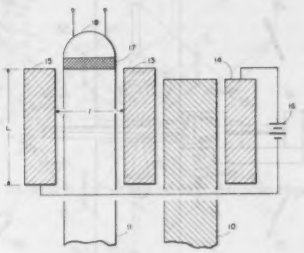
1. A light mixing device for a photographic enlarger comprising an elongated solid rod-like member of optically clear material of substantially uniform diameter having entrance and exit ends and adapted to mix light entering the entrance end to substantially uniform intensity and color distribution at the exit end, at least a portion of the length of said member providing internal substantially parallel surfaces extending along the length thereof for reflection of light therefrom generally in the direction of the length of said member whereby light entering said member at said entrance end is mixed by internal reflections from said peripheral walls and said internal surfaces and the mixed light exits said exit end.

4,125,316

INTEGRATED OPTICAL MATRIX MULTIPLIER

Larry B. Stotts, Chula Vista, and Paul S. Catano, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 23, 1977, Ser. No. 799,809
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.13 **9 Claims**



1. An integrated optical row-column vector multiplier comprising:

a first optical waveguide defined by a linear path of photoconductive material in a supporting substrate;

a second optical waveguide defined by a linear path of electrooptic material in said supporting substrate and in spaced parallel disposition relative to said first optical waveguide;

a first electrode comprised of electrically conductive material supported on said substrate between said first and second optical waveguides;

second and third electrodes comprised of electrically conductive material supported on said substrate contiguous to said first and second optical waveguides and opposite said first electrode;

a constant amplitude d.c. electrical source connected to said second and third electrodes;

a first coherent source of light signal intensity modulated in accordance with a column vector function and propagated along said first optical waveguide;

a second coherent source of light signals intensity modulated in accordance with a row vector function and propagated along said second optical waveguide;

a polarization analyzer positioned to intercept the output light signals of said second optical waveguide; and

an integrating storage detector responsive to said output light signals for generating commensurate electrical signals representative of the multiplication of said column vector function and said row vector function.

4,125,317

OPTICAL INSPECTION SYSTEM EMPLOYING DUAL PATH PICKUP SYSTEM WITH SINGLE SPHERICAL MIRROR

Jason M. Gordon, Katonah, N.Y., and Peter E. Raber, Milford, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 26, 1977, Ser. No. 855,117
Int. Cl.[2] G01B *11/24*; G02B *27/14*
U.S. Cl. 356—376 **5 Claims**

1. An optical system for use with apparatus for contouring the surface of a test specimen, comprising:

jig means for moving said test specimen in a plane;

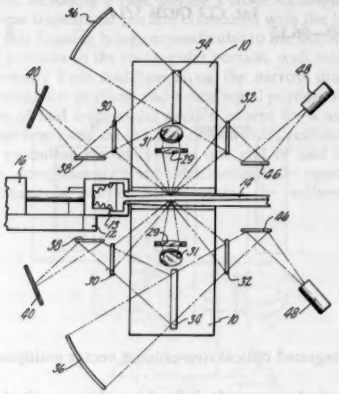
source means for directing a beam of electromagnetic energy along an incident axis toward said test specimen;

main beam splitter means disposed perpendicular to the plane in which said test specimen moves;

secondary beam splitter means having at least two optical members disposed on opposite sides of said incident axis, each collecting scattered electromagnetic energy along a

separate axis and redirecting said electromagnetic energy toward said main beam splitter to be combined along a common collecting axis;

spherical mirror means disposed along said collecting axis at an optical distance from surface of the test specimen such



that it operates at approximately a one-to-one magnification ratio, for focusing electromagnetic energy impinging thereon; and

means responsive to electromagnetic energy focused by said spherical mirror for indicating contour variations in said test specimen.

4,125,318

TIR MODULATOR

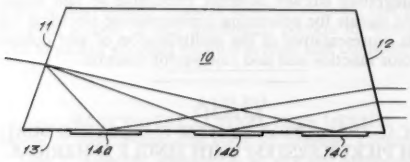
Marek T. Scibor-Rylski, Hartley Wintney, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 1, 1977, Ser. No. 783,877

Claims priority, application United Kingdom, Jul. 30, 1976, 31918/76

Int. Cl.[2] G02F *1/32*

U.S. Cl. 350—356 **7 Claims**



1. An electro-optic modulator/deflector for use with a light beam formed of at least two wavelengths of light including an electro-optical material and an electrode pattern adjacent a first surface of said material arranged in response to a voltage supply to provide an electric field in the material to influence the deflection of the light beam at the moment of total internal reflection at the first surface, means for dividing the light beam into its constituent wavelengths and for directing said constituent wavelengths at different parts of said first surface, and electrode pattern comprising interdigitated electrodes arranged so as to modulate separately the different wavelengths by predetermined respective amounts in a manner whereby one of the orders of the diffraction pattern for each wavelength is extinguished substantially simultaneously.

4,125,319

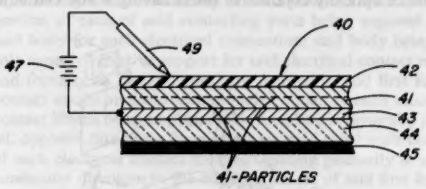
ACTIVE LIGHT CONTROL DEVICE

Lee F. Frank, and Joseph Y. Kaukeinen, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 3, 1976, Ser. No. 682,305

Int. Cl.[2] G02F *1/28*

U.S. Cl. 350—362 **26 Claims**



1. Improved active light control apparatus comprising:

(a) a light control layer including a solid elastomeric matrix and a plurality of minute dipole light control particles supported by said matrix; and

(b) means for selectively providing an electric field across said control layer.

4,125,320

RETINOMETER

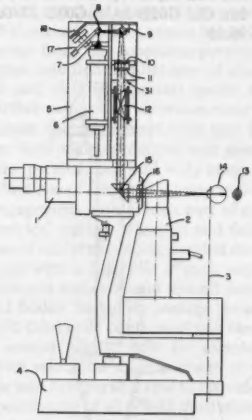
Bernd Rassow, Hamburg; Diethard Wolf, Lubeck, and Klaus Korner, Grosshansdorf, all of Germany, assignors to Optische Werke G. Rodenstock, Germany

Filed Jul. 20, 1976, Ser. No. 707,031

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1976, 2616139

Int. Cl.[2] A61B *3/10, 3/00*

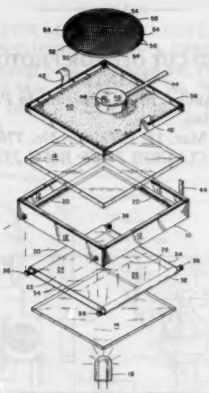
U.S. Cl. 351—13 **19 Claims**



1. A laser interference instrument for measurement of retinal visual acuity of the human eye, comprising a laser light source, interference optical means for projecting an interference light pattern of light from said laser light source on the retina of an eye over two different optical paths, and observation optical means for optically observing the points of irradiation of the interference light pattern on the eye, characterized in that said interference optical means together with said observation optical means are disposed for fine adjustment with reference to the examined eye on a traveling instrument support, wherein said interference optical means includes one plate of a plurality of plates selectively provided in the beam path of said laser light source to double the laser beam provided thereby with

reflection occurring on the front and rear surfaces of the said plate, and characterized in that said plurality of plates differ in thickness, and including holder means for selectively moving each plate into the beam path to vary the interference light pattern.

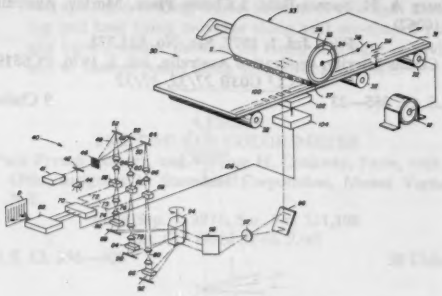
4,125,321
APPARATUS FOR PROJECTING LIGHT IMAGES
Edward E. Wright, 6431 Glenroy, San Diego, Calif. 92120
Filed Dec. 6, 1976, Ser. No. 747,669
Int. Cl.[2] G03B *21/26, 21/14*
U.S. Cl. 353—44 **11 Claims**



1. An apparatus for controlling light images projected onto a display media by a source of light, said apparatus comprising:
   a. an open tray member having a transparent surface capable of transmitting light positioned between said source and said display media;
   b. a layer of loose particulate material freely supported upon the upper surface of said member, said particular matter being displaceable from one area on said surface to another area on said surface to enable selected areas on said surface to be cleared of the particulate matter to allow light from said source to pass through said areas and be projected on said display media to simulate desired images;
   c. said particulate material being capable of transmitting sufficient light to allow indicia marked on the member to be visible to an operator through the particulate material to guide the operator in clearing the particulate material from said selected areas.

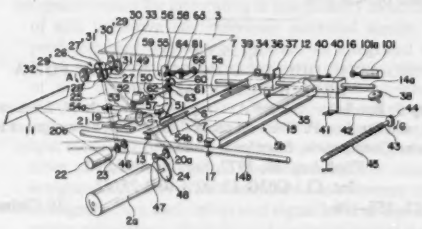
4,125,322
ELECTROPHOTOSENSITIVE MIGRATION IMAGING APPARATUS AND METHOD
Joseph Y. Kaukeinen, and John R. Michener, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Jun. 6, 1977, Ser. No. 804,046
Int. Cl.[2] G03G *17/04*
U.S. Cl. 355—4 **30 Claims**

1. Improved apparatus for producing electrophoretic migration color images at an exposure station, said apparatus comprising:
   (a) means for supporting an image receiver at said exposure station;
   (b) means for providing contiguous a supported receiver a mixture containing electrophotosensitive color particles of at least two color types;
   (c) means for producing a migration-inducing field across said mixture; and
   (d) means for sequentially exposing the mixture within such field to imagewise light, initially of a first color to which one of said particle types is sensitive and thereafter of a



second color to which the other of said particle types is sensitive.

4,125,323
ELECTROPHOTOGRAPHIC COPYING MACHINE OF A MULTI-SIZE COPYING TYPE
Hiroshi Ikeda, Aichi; Yasuhiko Doi, Toyokawa, and Masamichi Hayashi, Aichi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed May 20, 1977, Ser. No. 799,128
Claims priority, application Japan, May 31, 1976, 51-63306
Int. Cl.[2] G03G *15/00*; G03B *27/70*
U.S. Cl. 355—8 **12 Claims**



1. An electrophotographic copying machine of the type for producing copied images having the same size as or a different size from an original to be copied, said electrophotographic copying machine comprising:
   (a) a recording member;
   (b) optical means including slit defining means for projecting the image to be copied along an optical path onto said recording member;
   (c) means for changing the magnification of the image projected onto said recording member by said optical means; and
   (d) adjusting means positioned in the optical path for adjusting the relative widths of the portions of the slit defined by said slit defining means in the direction along the length of the slit for causing the distribution of the amount of exposure of the image being projected on said recording member by said optical means for one magnification to be the same as the distribution of the amount of exposure for the other magnifications, whereby the distribution of the amount of exposure of the image projected on said recording member is maintained in a predetermined distribution along the length of the slit regardless of a change of magnification.

4,125,324
COPYING APPARATUS

Harry A. H. Spence-Bate, 1 Cheam Place, Morley, Australia (6062)

Filed Jul. 1, 1977, Ser. No. 812,371
Claims priority, application Australia, Jul. 2, 1976, PC6519
Int. Cl.[2] G03B *27/32, 27/52*
U.S. Cl. 355—23 9 Claims

1. Copying apparatus for copying both sides of a record including a copying lens system, at least two transparent sheets of material hinged at a hinge axis adjacent one side of the sheets so as to hold a record between two of the sheets,

said sheets being rotatable as a pair through at least 90° about said hinge axis,

said hinge axis being in an optical axis of said copying lens system,

said sheets being arranged to hold a said record in the front focal plane of said copying lens system, and

a masking device disposed between said copying lens system and the back focal plane of said lens system,

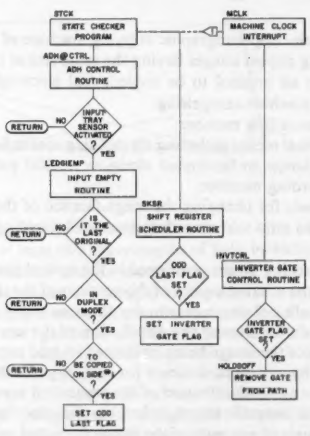
said masking device comprising masking means defining a masking aperture with one edge of said aperture being aligned with said optical axis, and

said masking means being arranged to be movable across said optical axis.

4,125,325
AUTOMATIC DUPLEX CONTROL SYSTEM FOR A REPRODUCTION MACHINE

Phillip J. Batchelor; Gerald A. Gray, Jr.; Kenneth W. Laskowski, and Stephen P. Wilczek, all of Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 30, 1977, Ser. No. 829,020
Int. Cl.[2] G03G *15/00;* G03B *27/32*
U.S. Cl. 355—26 10 Claims



1. In a reproduction machine capable of making duplex copies from original documents, said machine including document handler means for locating the documents in seriatim on an exposure platen, and means for forming a finished copy of each document on one side of a copy sheet, wherein the improvement comprises:

a receptacle for receiving the finished copy sheets;

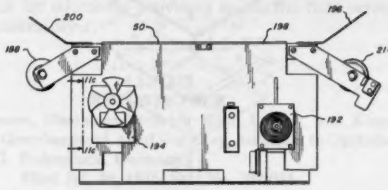
deflector means for preventing said copy sheets from entering said receptacle and for directing said copy sheets to a container from which the copy sheets are subsequently fed to form images on their opposite sides; and

control means for inhibiting said deflector means when the last original document to be duplex copied is odd in number so that the finished copy sheets thereof proceed to said receptacle without being returned to the container.

4,125,326
PAPER FEED CUT OFF FOR PHOTOGRAPHIC PRINTER

Victor R. Baert, Anoka, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Mar. 11, 1977, Ser. No. 776,930
Int. Cl.[2] G03B *27/58;* B65H *25/32*
U.S. Cl. 355—74 9 Claims



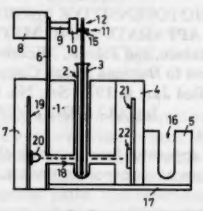
1. In a photographic printer having a paper feed system for advancing print paper by a predetermined feed length after each exposure, the improvement comprising:

paper feed cut off means for terminating paper feed after a predetermined period if paper feed has not been previously terminated, wherein the predetermined period exceeds the time normally required for advancing the print paper the predetermined feed length.

4,125,327
METHOD AND APPARATUS FOR SIMULTANEOUSLY RECORDING REACTION TIMES

Joel Margolis, Sydney, Australia, assignor to Gradient Pty. Limited, Sydney, Australia

Filed Nov. 1, 1976, Ser. No. 737,523
Claims priority, application Australia, Nov. 17, 1975, PC3998; Jan. 21, 1976, PC4587
Int. Cl.[2] G01N *33/16, 33/00, 21/24*
U.S. Cl. 356—39 12 Claims



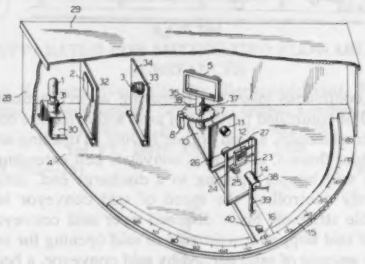
1. Apparatus for simultaneously determining the completion time, of chemical reactions producing an optical change, in a plurality of chemical samples each of which is contained in a transparent container and includes a suspension containing fibrin and an added particulate substance to which fibrin is capable of adhering, said apparatus comprising retention means to locate the plurality of containers with each container

interposed in a light path between a corresponding light source and a corresponding light sensor, and agitator insertable within said containers and movable to agitate said samples, a timer connected with said light sensors and operable by the outputs thereof, and means for switching on the timer, the latter means being operated with the commencement of the reaction in the containers, and means for stopping the timer constituted by the provision wherein, said particulate substance is so constituted that fibrin mesh formed by the samples during the chemical reaction traps the particles of said suspension and is swept away during agitation of the samples such that the timer is stopped by an increase of light to the detector.

4,125,328
APPARATUS FOR MEASURING REFLECTIVITY AND TRANSMISSIVITY OF A SPECIMEN

Shigeru Suga, Yoyogi 5-20-2, Shibuya-ku, Tokyo, Japan

Filed Mar. 25, 1977, Ser. No. 781,466
Int. Cl.² G01N *21/00, 21/16*
U.S. Cl. 356—73 **3 Claims**



1. Apparatus for measuring the reflectivity or transmissivity of a material, comprising:

a light source means having a tungsten lamp with a fine filament, a slit forming element with a slit therein, and a lens for focusing the light from said slit in said slit forming element into a parallel beam, said lamp, slit forming element and said lens lying in the recited order along a light source axis;

a specimen holding frame rotatably mounted for pivoting movement around an axis perpendicular to the axis of said light source means, a disc having an angular scale thereon connected to said specimen holding frame, and an index mounted on said light source axis relative to said disc for indicating the angle of light incident on a specimen mounted in said specimen holding frame, said specimen holding frame having specimen holding means thereon for holding a specimen with the surface thereof toward said light source means on said axis of pivoting movement;

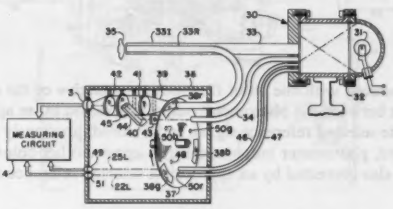
a light receiving unit having a base with one end pivotally mounted for pivoting movement around said axis of pivoting movement of said specimen holding frame, and further having a focusing lens, an optical template and a light receiver mounted on said base on a light receiving axis, said optical template having a plurality of opaque portions extending transversely thereof with transparent portions therebetween, said opaque portions being in at least two groups in which the spacing between the opaque portions is different from the spacing in the other group, said optical template having template moving means coupled thereto for moving the template transversely of the axis of said light receiving means and transversely to the direction of said opaque portions, and said light receiving unit further having a recording means coupled to said light receiver for recording the intensity of light received by said light receiver through said optical template as a continuous curve over a period of time; and

an arc-shaped plate having an angular scale thereon and extending from a point aligned with the light source axis and on the other side of said specimen holding frame from said light source means to a point at least on a line perpendicular to the light source axis from the axis of pivoting of said specimen holding frame, the end of said light receiving unit base being movable along said arc-shaped plate and having means thereon for fixing said light receiving unit at desired points along said arc-shaped plate.

4,125,329
TRISTIMULUS COLORIMETER

Park French, Aurora, and William H. Conaway, Paris, both of Ohio, assignors to Sterndent Corporation, Mount Vernon, N.Y.

Filed Sep. 7, 1976, Ser. No. 721,108
Int. Cl.² G01J *3/46, 3/48*
U.S. Cl. 356—405 **38 Claims**



1. A comparison type optical measuring apparatus, comprising:

photosensitive means for producing an electrical output representative of light received thereby,

optical means for sequentially directing unknown and reference light beams to said photosensitive means thereby to cause said photosensitive means to produce, respectively, unknown and reference electrical signals,

integrator means for integrating in one polarity direction one of said unknown and reference electrical signals for a predetermined duration to produce an integrated signal level and then in the opposite polarity direction the other of said unknown and reference electrical signals, and common circuit means for directing said unknown and reference electrical signals to said integrator means

output means for producing an electrical output signal indicative of the time required for said integrator means to integrate said other of said unknown and reference electrical signals from such integrated signal level to a predetermined signal level, whereby said electrical output signal is representative of a comparison of said unknown and reference light beams.

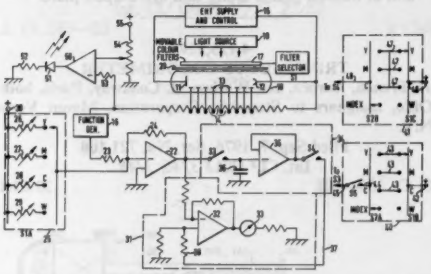
4,125,330
PHOTOMETRIC APPARATUS

Felix Schild, London, England, assignor to Electrical Instrumentation Co. Ltd., London, England

Filed Dec. 11, 1975, Ser. No. 639,771
Claims priority, application United Kingdom, Mar. 11, 1975, 45654/75
Int. Cl.² G01J *3/50*
U.S. Cl. 356—416 **13 Claims**

3. In a colour analyser, the combination, with a logarithmic photometer providing a photometer output, of selector means for selecting three primary colour filters and an "open filter", an output indicator including a first summing amplifier, four adjustable reference signal sources, selector means for selecting any one of said reference signal sources to provide a selected reference signal, a further signal combining amplifier, means for applying the selected reference signal to said further amplifier, means for applying the photometer output to said further amplifier, means for applying the output of said further amplifier to the input of said first summing amplifier, a voltage store, a first switch means operable to connect the output of

said further amplifier to said store, and a second switch means operable to connect the store output to the first summing amplifier in opposition to the output from said further amplifier, so that the output of said first summing amplifier obtained



on sensing with one color filter is representative of the difference between the photometer output, corrected by an appproprate selected reference signal, and a stored, previously determined, photometer output measured using another color filter and also corrected by an appropriate selected reference signal.

4,125,331

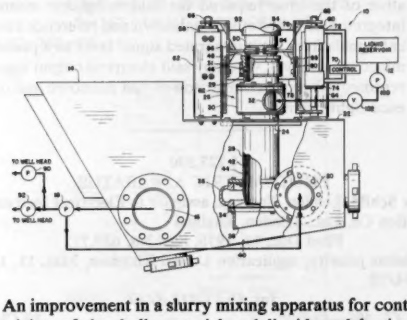
MIXING APPARATUS

James P. Chisholm, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 9, 1977, Ser. No. 794,876

Int. Cl.[2] B28C *5/08*; B01F *13/10*

U.S. Cl. 366—21 **4 Claims**



1. An improvement in a slurry mixing apparatus for continuous mixing of dry bulk material and liquid, and having an elongated vertically disposed dry material passageway open at the bottom end thereof, a liquid inlet chamber surrounding the upper portion of dry materials passageway, the top of said inlet chamber being closed to the dry materials passageway, an elongated vertically disposed shroud member surrounding the dry material passageway and providing communication between the liquid inlet chamber and the bottom of the dry materials passageway, the improvement comprising:

adjustable closure means provided at the lower end of the shroud member adjacent the lower end of the dry material passageway for controlling the liquid flow discharging therefrom.

4,125,332

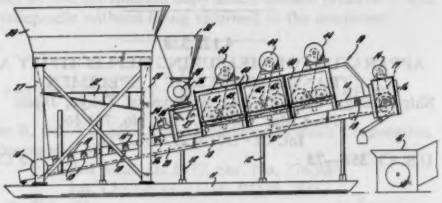
METHOD AND APPARATUS FOR MIXING LINER MATERIAL FOR MOISTURE RETENTION BASINS

Fred C. Schmednecht, Mount Prospect, Ill., assignor to Slurry Systems, Inc., Gary, Ind.

Filed Sep. 14, 1977, Ser. No. 833,057

Int. Cl.[2] B28C *5/02*

U.S. Cl. 366—33 **3 Claims**



1. A continuous mixer for preparing water retention liner material of controlled portions of sand and bentonite comprising, in combination a sand hopper having an opening adjacent the bottom thereof, an endless conveyor belt extending from beneath said hopper opening to a discharge end, means for selectively controlling the speed of said conveyor belt, an adjustable strike-off blade disposed over said conveyor belt adjacent said hopper downstream of said opening for controlling the amount of sand carried by said conveyor, a bentonite bin disposed over said conveyor downstream of said strike-off blade, means including a rotary feeder and a drop chamber interposed in series between said bentonite bin and said conveyor for regulating the amount of bentonite deposited on said conveyor, means for controlling the speed of said rotary feeder, means for introducing moisture into said drop chamber including a moisture supply line having pressure regulating and adjustable flow control means therein and a spray manifold extending into said drop chamber, and means including a plurality of mixing paddles located over and closely adjacent said conveyor downstream of said drop chamber for mixing the controlled amounts of sand, bentonite and moisture deposited on said conveyor.

4,125,333

EXTRUSION APPARATUS

Reuben T. Fields, 2146 Culver Dr., Colonial Village, Wilmington, Del. 19810

Continuation-in-part of Ser. No. 460,357, Apr. 12, 1974, abandoned. This application Apr. 12, 1976, Ser. No. 675,995

Int. Cl.[2] B29B *1/06*; B01F *7/08*

U.S. Cl. 366—79 **10 Claims**

1. An extrusion apparatus for extruding plastic resins having a low coefficient of friction, comprising, in combination:

(a) A barrel member having a feed-port near one end and a discharge port at the opposite end, said barrel member having an interior surface extending substantially

throughout the length of the barrel between the feed-port and the discharge port, said barrel member adapted to receive a screw member having an appreciable land and a predetermined lead and hand, said interior surface of the barrel member having a shallow spiral groove extending substantially throughout the length of said barrel, said groove having a lead substantially equal to the lead of the screw, a width that is equal to or less than the land of the screw and of the same hand as the screw;

(b) a screw member mounted within said barrel adapted to rotate within the barrel, said screw member having a predetermined hand, a lead substantially equal to the diameter of the screw, an appreciable width of the land and closely mating with said interior surface of said barrel member; whereby said groove produces an increased grip of the barrel on said plastic resin to produce a uniform delivery and high output of said plastic resin and high pressure without appreciable loss of output;

(c) rotating means for rotating said screw member; and

(d) heating means for heating said barrel member.

4,125,334

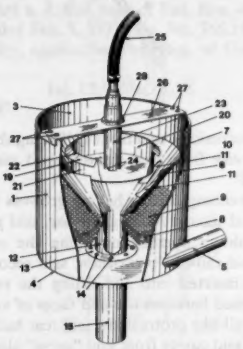
APPARATUS FOR MIXING TWO FLOWABLE SUBSTANCES

Graham S. Jones, Woodville, Nr. Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Nov. 17, 1977, Ser. No. 852,455

Int. Cl.[2] B01F *5/00;* **B28C** *5/04*

U.S. Cl. 366—181 **8 Claims**



1. An apparatus for mixing two flowable substances, which apparatus comprises a first container for a first flowable substance, said first container having first inlet means and a first overflow lip, a second container for the second flowable substance, said second container having second inlet means and a second overflow lip, an inclined face positioned below both first and second overflow lips and outlet means, whereby a first flowable substance fed into said first container overflows said first overflow lip onto said inclined face, a second flowable substance fed into said second container overflows said second overflow lip onto the inclined face and mixes thereon with the first flowable substance.

4,125,335

AGITATOR SYSTEM

Horst K. Blume, 3375 Hillcroft Rd., Huntingdon Valley, Pa. 19006, and Adolf Erpel, 2303 Oakfield Rd., Warrington, Pa. 18976

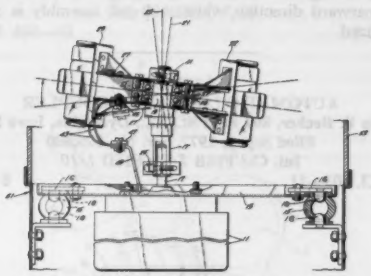
Filed Feb. 3, 1977, Ser. No. 765,178

Int. Cl.[2] B01F *11/00*

U.S. Cl. 366—209 **6 Claims**

1. A motor driven agitator system comprising:

a drive motor having a rotatable output shaft, said shaft including a first portion extending from said motor and a second portion extending from said first portion at an oblique angle thereto; agitator means carried on said second portion of said shaft, said agitator means including a supporting means and at least one receptacle holding means fixedly attached to said supporting means and radially spaced from said first portion of said shaft, bearing means between said agitator means and said second portion of said shaft, said bearing means including a first portion carried by said supporting means and a second portion fixed to said second portion of said shaft for rotation therewith whereby said second portion of said shaft and said second portion of said bearing means can rotate



relative to said supporting means and said first portion of said bearing means; and,

resilient means made of tough flexible plastic material fixed at one end to said supporting means and at the other end to a fixed support for restraining rotational movement of said supporting means and said receptacle holding means about the axes of said shaft, said resilient means being flexible in a direction substantially parallel to the axes of said first portion of said shaft so that when said shaft is rotating said receptacle holding means oscillates in a plane substantially parallel to the axis of said first portion of said shaft.

4,125,336

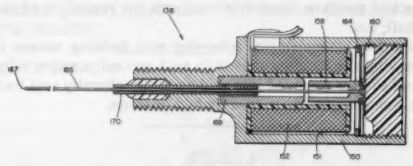
DOT MATRIX PRINTER

Ge Y. Chu, Lincoln, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Division of Ser. No. 675,205, Apr. 8, 1976, abandoned. This application Feb. 3, 1977, Ser. No. 765,079

Int. Cl.[2] B41J *3/12*

U.S. Cl. 400—124 **2 Claims**



1. In a dot matrix printer head assembly having a plurality of axially movable elongated print wires

wire drive means for each of said print wires, comprising

a housing having a central opening extending from the front to the rear of said housing

a hollow annular shaped opening surrounding a rearward portion of said central opening

an annular shaped coil assembly positioned within said annular shaped opening and surrounding the rearward portion of said central opening

a cylindrical shaped armature positioned for reciprocating movement within the rearward portion of said central

opening so that at least a portion of said armature is surrounded by said coil assembly; said armature having a central through bore enlarged in its forward portion for a substantial distance toward the rearward end thereof

the rearward portion of each of said print wires extending into the central opening of an associated one of said driving means through said armature and being joined to the rear end of said armature

said print wire outer surface being spaced inwardly from the inner surface of said through bore enlarged forward portion, and

a biasing member secured to the rear end of said armature

said biasing member normally urging said armature in the rearward direction when said coil assembly is deenergized.

4,125,337

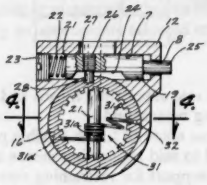
AUTOMATIC LOCK OPEN COUPLER

Florian B. Recker, 802 First St., SE., Dyersville, Iowa 52040

Filed Sep. 1, 1977, Ser. No. 829,800

Int. Cl.[2] F16B *7/00*; F16D *1/10*

U.S. Cl. 403—11 **6 Claims**



1. A torque transmitting coupling comprising:

a housing;

an opening in said housing, a portion of said opening being non-circular, said opening being adapted to receive a non-circular portion of a shaft;

means for selectively locking the non-circular portion of said shaft into the opening in said housing, said locking means being biased to a locked position and selectively movable to an unlocked position;

means for selectively holding said locking means in the unlocked position whereby said shaft can be freely received into said opening, said holding means being movable between a first position and a second position;

means for automatically moving said holding means to the first position thereof when said shaft is removed whereby said holding means holds said locking means in the unlocked position thereof in readiness for reception of said shaft; and

means for automatically releasing said holding means by moving the holding means to said second position when said shaft is received into said opening whereby said locking means can move to a locked position.

4,125,338

QUATREFOIL CONNECTOR CONNECTING SHELVES

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Filed Feb. 7, 1977, Ser. No. 766,364

Int. Cl.[2] F16B *5/00*

U.S. Cl. 403—169 **7 Claims**

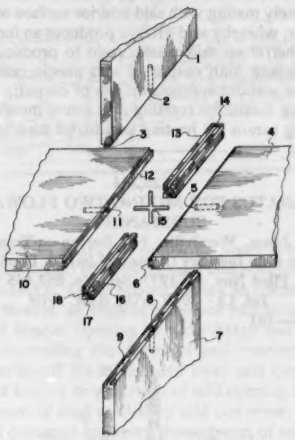
1. Apparatus joining four boards into a "cross-joint,"-wherein said four boards are joined to each other with an angle of 90° between any two adjacent boards, each of said boards having a front edge and a rear edge, said apparatus comprising in combination:

(a) a rail-like protrusion formed on the end face of each of said boards, said rail-like protrusion having a narrowed-down neck,

(b) a hole drilled into the end face of each of said boards, the opening of said hole of each of said boards converging to a single point in said cross-joint,

(c) a "cross"-shaped pin, each of four arms of said cross-shaped pin engaging each of said holes drilled into the end face of said four boards,

(d) a first rectangular bar having grooves formed on four sides of said first rectangular bar, said grooves having a narrowed-down opening matching the narrowed-down neck of said rail-like protrusion, said first rectangular bar being inserted into and filling the front half of the cavity formed between the end faces of said four boards with said



rail-like protrusions, said front half being the front portion of said cavity from said cross-shaped pin to said front edges, and

(e) a second rectangular bar having grooves formed on four sides of said second rectangular bar, said grooves having narrowed-down opening matching the narrowed-down neck of said rail-like protrusion, said second rectangular bar being inserted into and filling the rear half of the cavity formed between the end faces of said four boards with said rail-like protrusions, said rear half being the rear portion of said cavity from said "cross"-shaped pin to said rear edges.

4,125,339

RELEASABLY INTERLOCKED, ASSYMMETRICAL, LUGGED FLANGE JOINT WITH FIXED RELATIVE ORIENTATION

Charles B. Pittinger, Sr., Rte. 1, Box 68, Weatherford, Tex. 76086, and Charles B. Pittinger, Jr., 320 Cockeys Mill Rd., Reisterstown, Md. 21136

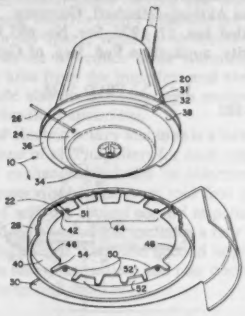
Filed Jun. 29, 1977, Ser. No. 811,285

Int. Cl.[2] B25G *3/00*

U.S. Cl. 403—348 **24 Claims**

1. A detachable locking-connection for assembly of first and second parts of a filament trimmer or the like in which one of said first and second parts is a housing and the other of said first and second parts is a shield, comprising: the first part having male flange structure with at least one interruption therein, the second part having female flange structure with at least one interruption therein located for coupling the female flange structure with the male flange structure on contact therewith

and rotation relative thereto, and means for locking the first and second parts together including at least one locking finger



on said second part biasable into said male flange structure interruption.

4,125,340

TRAFFICABLE SURFACE FOR MECHANICAL PARKING APPARATUS, RAMPS, LIFTING PLATFORMS OR THE LIKE

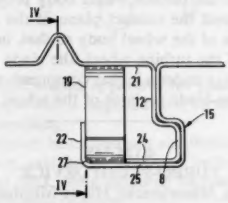
Kaspar Klaus, Dr.-Berndl-Str. 5, 8940 Memmingen, and Fritz Zepp, 7951 Rot a. d. Rot, both of Fed. Rep. of Germany

Filed Feb. 7, 1977, Ser. No. 766,197

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1976, 2604882

Int. Cl.[2] E01C *5/16*

U.S. Cl. 404—35 **7 Claims**



1. In a vehicle-accessible surface for mechanical parking devices, ramps, lifting platforms and the like comprising a plurality of adjoining intercoupled substantially like supports made of sheet metal of substantially uniform wall thickness and each including a load-bearing supporting surface with downturned first and second side parts the first of which is of greater overall depth than the second side part, whereby the first side part of one support can engage below the second side part of an adjacent support, and said first and second side parts being cranked to provide surfaces which are respectively parallel to and at right angles to the load-bearing supporting surface for nesting interengagement with the side parts of adjacent supports, the improvement wherein each of the first and second side parts comprises four adjacent surface strips consisting of a first strip at right angles to the load-bearing surface, a second strip at right angles to the first strip, a third strip at right angles to the load-bearing surface, and a fourth strip parallel to the load-bearing surface, each of these strips bearing directly against the corresponding strip of the side part of the intercoupled adjacent support, the outermost and fourth strip of one of said first and second side parts is extended by an upturned flange forming a channel at the lower end of the side strip concerned, the extended fourth strip having a greater width than the fourth strip on the other side part and at least one spacing element resiliently engaged between the foreshortened fourth strip of one support and the underside of the load-bearing surface of this support, the spacing element having a width which constitutes a rigid abutment between said upturned flange of the other support and the said first strip of the one support.

4,125,341

PAVING BLOCK

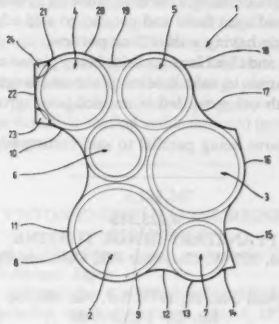
Hans Reinschutz, Geigersbergstrasse 2, 7500 Karlsruhe 41, Germany

Filed Aug. 26, 1977, Ser. No. 828,087

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1977, 7700509[U]

Int. Cl.[2] E01C *5/00*

U.S. Cl. 404—41 **10 Claims**



1. A polygonal paving block having a base, side walls and an upper surface, said upper surface comprising at least four projecting elements, the side walls of said block presenting convex and concave curvilinear generatrices which are disposed substantially entirely in respective parallel planes of the side walls of said block, at least a part of the side walls of the block also forming at least one flat surface lying in a plane parallel to said respective parallel planes of said curvilinear generatrices.

4,125,342

CLAMPING ARRANGEMENT FOR THE REPLACEABLE BLADE OF A ROTARY CUTTING TOOL

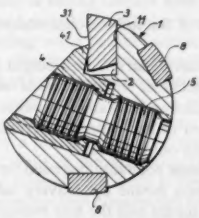
Dieter Kress, Aalen, Fed. Rep. of Germany, assignor to MAPAL Fabrik für Präzisionswerkzeuge Dr. Kress KG, Aalen, Fed. Rep. of Germany

Filed Apr. 4, 1977, Ser. No. 783,968

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1976, 2614599

Int. Cl.[2] B23B *27/16, 29/02*

U.S. Cl. 408—179 **4 Claims**



1. In a tool including a cutter head; drive means for rotating said head about an axis, a face of said head circumferentially bounding a recess in said head, said recess being open in one circumferential direction and a radially outward direction; a

clamping shoe having a face opposite said face of said head and bounding said recess in said one circumferential direction; adjusting means for circumferentially moving said shoe inward of said recess; and a reversible blade retained in said recess by engagement of respective first and second face portions of said blade with said faces of said shoe and of said head respectively, the improvement which comprises:

(a) said face portions and the engaged respective faces of said head and of said shoe defining two planes of contact,

(b) said planes converging in a radially outward direction at an acute angle,

(c) said blade having an axially extending first cutting edge radially projecting from said recess and a second cutting edge parallel to said first edge and received in said recess,

(d) said edges defining a median plane of symmetry of said blade equidistant from and parallel to said edges,

(e) said blade having a third face portion,

(f) said first and third face portions being planar and symmetrical relative to said median plane and angularly offset from each other to define an elongated groove in said blade,

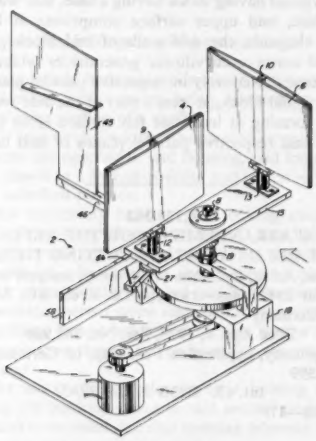
(g) said groove being parallel to said cutting edges.

4,125,343

PLANETARY BLADE TURBINE

Leonard Olson, 107 W. Cheyenne Rd., Colorado Springs, Colo. 80906

Filed Jun. 20, 1977, Ser. No. 808,266
Int. Cl.[2] F03D 7/06
U.S. Cl. 416—17 **3 Claims**



1. A fluid motor of the turbine class comprising in combination:

a rotatable base having an attached output shaft disposed and positioned coincident with the axis of rotation of the base;

a plurality of blades each rotatably mounted on said base, the axis of rotation of said blades describing a circular path around the said output shaft;

circular gear means rotatably disposed on said shaft;

speed transmission means operatively interconnecting the circular gear means and the said rotatable blades;

weathervane means pivotally mounted on said output shaft and having a vane perpendicular to the said base;

an elastic interconnection between the weathervane means and the circular gear means; and

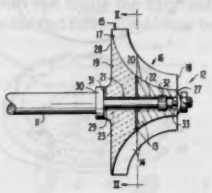
a speed control vane connected to the said elastic interconnection.

4,125,344

RADIAL TURBINE WHEEL FOR A GAS TURBINE

Eberhard Tiefenbacher, Ludwigsburg, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Jun. 17, 1976, Ser. No. 697,193
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1975, 2527498
Int. Cl.[2] F01D 5/28
U.S. Cl. 416—183 **9 Claims**



1. A radial turbine wheel for a gas turbine, comprising:

(a) a turbine wheel body formed with blades, said turbine wheel body having a first ceramic part comprising an outer section of blades and having a second metallic part comprising an inner essentially curved section of blades;

(b) a turbine shaft on which said turbine wheel body is mounted; and

(c) a central connection means, said connection means having both compressive means for holding together said first and second turbine wheel body parts with said turbine shaft and elastic means for compensating different thermal expansions of said first and second turbine wheel body parts and of said turbine shaft,

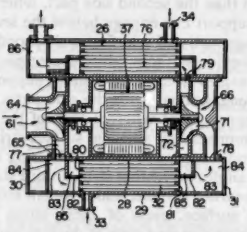
characterized in that the blade sections of at least one of the two parts of the turbine wheel body project by a slight amount beyond the contact plane of the adjoining non-blade section of the wheel body so that, in the assembled condition of the turbine wheel, the blade sections of the wheel body are under a higher compressive stress than the adjoining non-blade sections of the wheel body.

4,125,345

TURBO-FLUID DEVICE

Yoichi Yoshinaga, Minorimachi; Haruo Mishina, Ushikumachi, and Kazuhiro Sunobe, Urawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 15, 1975, Ser. No. 613,429
Claims priority, application Japan, Sep. 20, 1974, 49-107795; Jan. 6, 1975, 50-88; Jun. 24, 1975, 50-76716
Int. Cl.[2] F04B 23/00
U.S. Cl. 417—243 **6 Claims**



1. Turbo-fluid apparatus comprising:

a first impeller,

a second impeller,

an electric rotary machine drivingly connected with said impellers,

and a heat exchanger for accommodating heat exchange

between gases discharged from at least one of said impellers and a further heat exchange medium,

wherein said heat exchanger is formed in an annular shape to define a columnar space therein, and wherein said impellers and said electric rotary machine are disposed within said columnar space, whereby structure of said heat exchanger serves to reduce noise transmission to the surrounding area from the impellers and electric rotary machine while also accommodating a compact construction of the turbo-fluid apparatus,

wherein said electric rotary machine is a two stage compressor with one of said impellers for each stage, and wherein said heat exchanger includes an intermediate cooler for cooling gases discharged from said first impeller prior to passage of said gas to said second impeller,

wherein said heat exchanger includes a rear cooler for cooling gas discharged from said second impeller,

and wherein said intermediate and rear coolers are arranged concentric to one another.

4,125,346

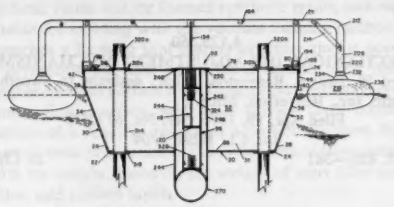
RANDOM WAVE HYDRAULIC ENGINE

William H. Pickle, Knoxville, Tenn.

Continuation-in-part of Ser. No. 622,764, Oct. 15, 1975, abandoned. This application Feb. 11, 1977, Ser. No. 767,732

Int. Cl.[2] F04B *17/00, 21/02*

U.S. Cl. 417—332 **2 Claims**



1. A hydraulic engine apparatus for pumping water within which said apparatus is disposed to a location remote to said apparatus comprising:

a barge structure being bouyant and floating at the surface of said water, said barge structure including a hull and a deck, said deck being mounted on said hull in a substantially horizontal position;

a pumping system carried by said barge structure, said pumping system including a plurality of pumping units mounted in fluid communication with said water,

float members associated with each of said pumping units, each of said float members having disposed in said water proximate said barge structure, said float members rising and falling independently responsive to the movement of waves proximate said float members,

linkage means interconnecting each of said float members and at least one of said pumping units, whereby the rising and falling of said float members serves to actuate said pumping units,

discharge pipe means mounted in fluid communication with each of said pumping units for receiving water discharged by said pumping units, said discharge pipe means extending to said remote location, whereby actuation of said pumping units responsive to the rising and falling of waves in said water serves to pump water through said discharge pipe means, said pumped water being discharged at said remote location,

each of said pumping units includes a cylinder defined by a substantially cylindrical wall disposed in an upright position, said wall having a first end portion secured to said deck, and a further end portion secured to said discharge pipe, first and further means closing the opposite end portions of said cylinder to define a chamber, a piston having a piston head slidably disposed in said chamber and forming a seal with the wall of said cylinder thereby dividing said chamber into first and further sections, and a rod connected at one of its ends with said piston head, the opposite end of said piston rod being connected to said linkage means, intake valve means providing selective fluid communication between said water and at least one of said chamber sections, discharge valve means providing selective fluid communication between at least one of said chamber sections and said discharge pipe whereby the rising and falling of said float members serves to reciprocate said piston head along said cylinder and pump water into said discharge pipe means and

bulkhead means mounted on said barge structure and partially enclosing said pumping units, said

bulkhead means including an intake manifold section which contains water at a level above the level of said intake valve means and a discharge manifold section which receives water discharged through said exhaust valve means, said discharge manifold section communicating with the interior of said discharge pipe means whereby water pumped from said pumping units enters said discharge manifold section and is directed into said discharge pipe means.

4,125,347

ROTARY PISTON ENGINE HAVING REINFORCED SIDE HOUSINGS

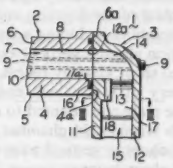
Kuniaki Kakui, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed May 5, 1977, Ser. No. 794,108

Claims priority, application Japan, May 6, 1976, 51-57111[U]

Int. Cl.[2] F04C *29/04*

U.S. Cl. 418—83 **11 Claims**



1. Rotary piston engine including a casing which comprises a rotor housing having an inner wall of trochoidal configuration and opposite side surfaces and a pair of side housings each comprised of an inner wall having an inner surface and an outer wall having an end surface which is coplanar with the inner surface of the inner wall, said side housings being secured to the opposite side surfaces of the rotor housing with the inner surfaces of the inner walls and the end surfaces of the outer walls thereof in contact with the side surfaces of the rotor housing, a substantially polygonal rotor disposed in said casing with apex portions in sliding contact with the inner wall of the rotor housing, said rotor housing being formed with a plurality of axially extending water jackets which are separated from each other by a plurality of circumferentially spaced intermediate walls, each of said side housings being formed with means for defining a water jacket having a plurality of openings which are aligned with said water jackets in the rotor housing and separated by a plurality of bosses provided between said inner and outer walls of the side housing and adapted to be aligned with the intermediate walls in the rotor housing, said rotor and side housings being connected together by a plurality of tightening bolts extending through the aligned bosses and intermediate walls, said side housing being provided on said inner wall with reinforcing means including a reinforcement rib extending between each two adjacent bosses substantially along a peripheral portion of said inner wall of the side housing at a side opposite to the rotor housing for reinforcing the inner

wall of the side housing against deflection under pressure of combustion gas.

4,125,348

SLIP FORMER WITH KEYWAY FORMING ASSEMBLIES

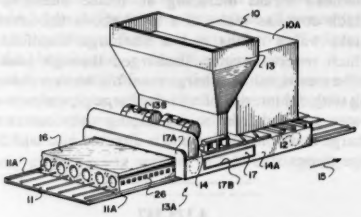
Ernst Martens, Winnipeg, Canada, assignor to Spiroll Corporation Ltd., Winnipeg, Canada

Filed Jun. 27, 1977, Ser. No. 810,427

Claims priority, application United Kingdom, Jul. 9, 1976, 28645/76

Int. Cl.[2] B28B *13/04*

U.S. Cl. 425—64 **15 Claims**



1. In an extrusion type slab forming machine mounted for movement on a pallet and including a source of power on said machine for operating same, a concrete receiving hopper, a forming and compacting chamber below the hopper defined by a horizontal top plate, apertured vertical side plates and the pallet, and a slab outlet at the rear end of said chamber from which the slab extrudes as it is formed, urging the machine along the pallet in front of the slab, the slab including substantially vertical side walls; shear keyway recess forming assemblies on each side plate of the forming and compacting chamber, each of said assemblies including a frame, a leading wheel journalled for rotation about a vertical axis within said frame, a plurality of spaced shear keyway recess forming projections around the periphery of said wheel engaging through said aperture in said side plate and adapted to engage the side wall of the forming slab within said chamber, a rear wheel journalled for rotation about a vertical axis within said frame, a plurality of spaced shear keyway recess finishing projections around the periphery of said rear wheel engaging through said aperture in said side plate and having a similar configuration to the projections of said leading wheel, said projections of said rear wheel adapted to engage the shear keyway recesses formed by said leading wheel, means for journalling said wheels within said frame, and means interconnecting said wheels whereby the rotation of said leading wheel by engagement with said slab side wall, causes rotation of said rear wheel in the same direction, the dimensions of the projections of said rear wheel being slightly less than the dimensions of the projections of said leading wheel.

4,125,349

CLAY EXTRUSION APPARATUS

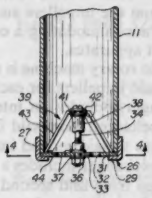
Albert Johnsen, 482 Swanton Rd., Davenport, Calif. 95017

Filed Jun. 8, 1977, Ser. No. 804,569

Int. Cl.[2] B29D *23/04*

U.S. Cl. 425—192 R **2 Claims**

1. An extrusion apparatus comprising, a cylindrical casing having an inner wall, a piston, means operatively associated with said piston for reciprocating said piston within said casing, said piston engaging said inner wall, said casing having a discharge end, an outer die fitting against said discharge end of said casing, said outer die having an opening, a ring around the outside of said casing having a thin annular flange below said outer die and fitting against the periphery of said outer die to detachably secure said outer die against said discharge end of said casing, means detachably securing said ring to said casing, an inner die of lesser size than said opening, and support means supporting said inner die within said opening disposed centrally of said opening, said support means comprising a top, a plurality of spider-like legs extending outward from said top, the distal ends of said legs resting on said outer die, the distal ends of said legs engaging said inner wall of said casing, an



elongated threaded member depending from said top, fastening means for detachably securing said inner die to the distal end of said threaded member, and a sleeve around said threaded member engaging said inner die, said fastening means comprising a nut on said threaded member below said inner die.

4,125,350

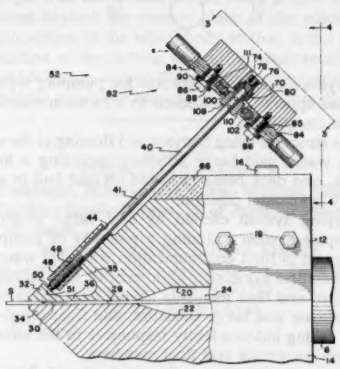
MECHANICAL DIE ADJUSTMENT MECHANISM

Gaylord W. Brown, Beaverton, Mich., assignor to Sweetheart Plastic, Inc., Beaverton, Mich.

Filed Apr. 19, 1976, Ser. No. 677,974

Int. Cl.[2] B29F *3/04*

U.S. Cl. 425—381 **29 Claims**



1. A sheet die comprising:

a die body having a pair of opposed, longitudinally extending die lips defining an elongate die opening through which plastic and the like is extruded in sheet form, one of said die lips being movable toward and away from the other of said die lips to adjust the size of said opening;

means operatively associated with said die body, for adjusting the position of said one die lip including rotatable die bolt means on said die body for moving at least a portion of said one die lip toward and away from said other die lip; and

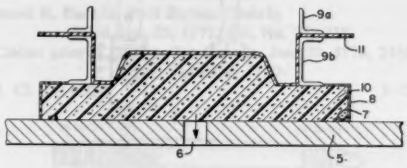
die bolt drive means, operatively associated with said die bolt means, movable in a longitudinal to-and-fro path of travel, for selectively rotating said die bolt means in either direction of rotation about the rotational axis of said die bolt means, as said die bolt drive means moves in said to-and-fro path.

4,125,351

PROCESS FOR THE PRODUCTION OF A FORMING TOOL FROM REACTIVE RESINS WITH FILLERS, AND FORMING TOOL

Franz Alfter, Siegburg; Hans-Ulrich Breitscheidel, Troisdorf, and Paul Spielau, Troisdorf-Eschmar, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 24, 1977, Ser. No. 780,787
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1976, 2612369
Int. Cl.[2] B29C *1/00, 17/00*
U.S. Cl. 425—403 12 Claims



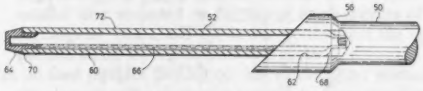
1. A forming tool made from reactive resins and inert fillers for the molding of single- or multiple-layer thermoplastic synthetic resins and/or foamed synthetic resins, and especially suitable for molding with the vacuum forming method, which comprises a forming tool shaped structure that is porous and air-permeable and that has a mold surface layer defining a roughened mold surface for molding said synthetic resins with a matte-finish surface, said mold surface layer containing a mixture of a reactive resin and a particulate inert filler, the reactive resin proportion in the mold surface layer being about 3–5% by weight, based on the weight of inert filler contained within said surface layer.

4,125,352

THERMAL VALVE PIN

Jobst U. Gellert, 11 Newton Rd., Brampton, Ontario, Canada

Filed May 4, 1977, Ser. No. 793,499
Claims priority, application Canada, Apr. 29, 1977, 277440
Int. Cl.[2] B29F *1/03*
U.S. Cl. 425—566 8 Claims



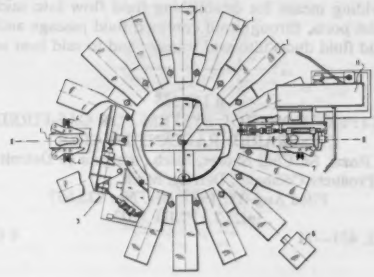
1. In a plastics molding system comprising a mold, a molding machine, a hot runner passage for containing a plastic melt and extending from the molding machine to the mold, a gate for the mold and a valve pin for said gate, wherein the valve pin has a driven end and a tip end and at least the portion of the valve pin having the tip end is disposed in the hot runner passage, the improvement wherein at least the portion of the valve pin near the tip end is formed of a hollow sealed tube containing a vaporizable liquid under partial vacuum, whereby heat from the plastics melt in the hot runner passage vaporizes the liquid in the hotter portion of the sealed tube nearest the driven end of the valve pin and the resulting vapor circulates toward the cooler portion of the sealed tube nearest the tip end and condenses, so that heat is transferred to the tip end of the sealed tube.

4,125,353

INJECTION-MOLDING INSTALLATION, PARTICULARLY FOR THE PRODUCTION OF FOOTWEAR

Alfred Stark, Friedhofgasse 9, Kittsee (Burgenland), Austria

Filed May 10, 1977, Ser. No. 795,442
Claims priority, application Austria, May 10, 1976, 3420/76
Int. Cl.[2] B29F *1/00;* B29H *7/08*
U.S. Cl. 425—576 4 Claims



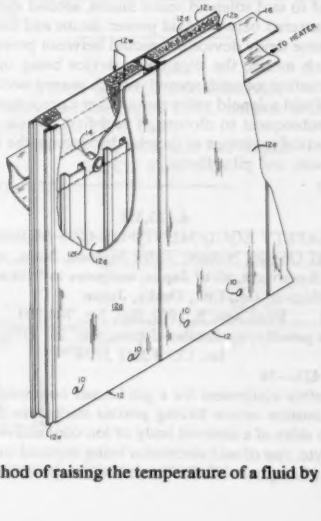
1. In a machine for producing footwear, in combination:
a movable mold carrier;
a multiplicity of openable and closable molds spacedly disposed on said mold carrier;
a single core-insertion station and a single injection station adjacent said mold carrier;
drive means coupled with said mold carrier for successively aligning each of said molds first with said core-insertion station and then with said injection station; and
support means at said core-insertion station operable upon the alignment of a mold therewith for introducing a last-shaped core from above into the aligned mold prior to a displacement of the latter to said injection station for the introduction of molding material into same.

4,125,354

OVEN HEAT EXCHANGER

David M. Andrews, Ivyland, Pa., assignor to Aztec Machinery Company, Inc., Ivyland, Pa.

Filed Feb. 22, 1977, Ser. No. 770,623
Int. Cl.[2] F23D *11/44*
U.S. Cl. 431—11 3 Claims



1. A method of raising the temperature of a fluid by using the

normally wasted heat emanating from the normally hot walls of an oven having a heat source comprising:

enclosing said walls with a closure spaced from said walls so as to create a confined fluid passage;

providing said closure with a plurality of fluid inlet ports;

providing said walls with a plurality of fluid ducts vertically offset from said plurality of fluid inlet ports;

providing a transfer duct within said oven to establish fluid communication between said plurality of fluid ducts and said heat source, and

providing means for establishing fluid flow into said fluid inlet ports, through said confined fluid passage and from said fluid ducts into said transfer and to said heat source.

4,125,355

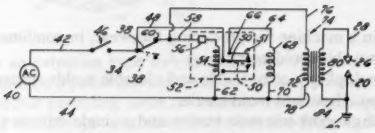
SAFETY CONTROL SYSTEM FOR GAS-FIRED INFRARED RADIANT HEATER

Mario Rozzi, St. Clair Shores, Mich., assignor to Detroit Radiant Products Company, Detroit, Mich.

Filed Aug. 11, 1977, Ser. No. 823,667

Int. Cl.[2] F23H *5/02*

U.S. Cl. 431—71 **4 Claims**



1. A safety control system for a gas-fired infrared radiant heater comprising a gas-fired infrared radiant heater having one open face composed of perforated ceramic tile structure, means for supplying a burnable air/gas mixture through said perforations for burning on said open face to heat the tile structure for emission thereof of infrared radiant heat, a pilot burner adjacent said open face for ingniting the air/gas mixture of the heater, means for supplying a burnable air/gas mixture to the pilot burner, electrically operated ignition means adjacent the pilot burner for igniting the pilot, temperature responsive means adjacent the pilot burner for detecting ignition of the pilot, first switch means operably connected to said temperature responsive means actuatable thereby to close when the pilot burner goes out and to open when said pilot burner is ignited, electrically operated solenoid valve means operably connected between the means for supplying a burnable air/gas mixture to the heater and pilot burner, electrical power means connected to said solenoid valve means, second switch means being connected between said power means and said solenoid valve, a time delay device connected between power and said first switch means, the time delay device being operative to cause actuation of said second switch means with resultant closing of said solenoid valve means after a predetermined time interval subsequent to closure of said first switch means and failure thereof to reopen to thereby discontinue the flow of gas to the heater and pilot flame.

4,125,356

SAFETY EQUIPMENT FOR GAS BURNER

Tokuyoshi Ohashi, Nabari; Akira Matuda, Nara, and Hiroshi Horii, Kashiwara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 5, 1977, Ser. No. 784,707

Claims priority, application Japan, Apr. 15, 1976, 51-43120

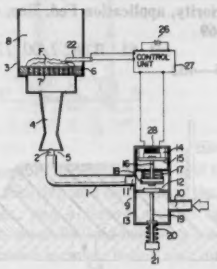
Int. Cl.[2] F23H *5/24*

U.S. Cl. 431—76 **7 Claims**

1. A safety equipment for a gas burner comprising:

a combustion sensor having porous electrodes disposed on both sides of a sintered body of ion conductive solid electrolyte, one of said electrodes being exposed to an exhaust gas atmosphere of the burner while the other electrode being exposed to a gas atmosphere other than said exhaust gas atmosphere, said sensor generating an e.m.f. depending on a ratio of oxygen concentrations of said gas atmospheres, a resistance of said sensor changing with a temperature;

an electromagnetic safety valve connected in a fuel supply path to said burner; and



an electrical control circuit responsive to a change in the e.m.f. of said combustion sensor due to incomplete combustion of said burner and responsive to a change in the resistance of said sensor due to extinction of said burner, for controlling said electromagnetic safety valve.

4,125,357

CONTROL AND MONITORING SYSTEM FOR GAS BURNERS

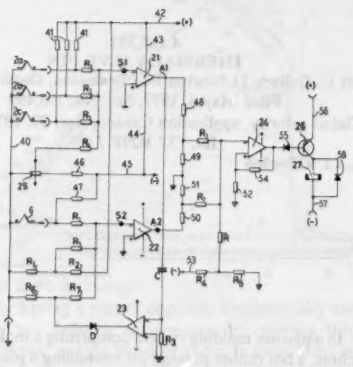
Klaus Kristen, Wiesbaden, and Herwig Scheidler, Finthen, both of Germany, assignors to Jenaer Glaswerk Schott & Gen., Germany

Filed Jul. 14, 1977, Ser. No. 815,507

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1977, 2700025

Int. Cl.[2] F23N *5/00*

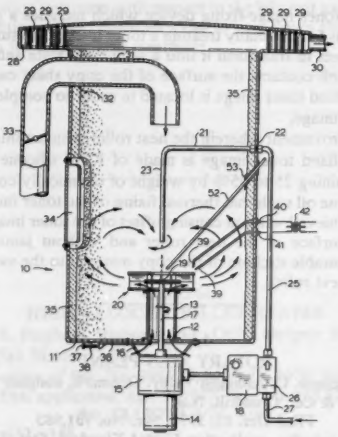
U.S. Cl. 431—78 **16 Claims**



1. A control and monitoring systems for a burner, for monitoring fuel ignition and combustion, controlling the average energy output of the burner, and establishing a maximum temperature limit, comprising an electronic circuit having four comparators, a first thermosensitive element connected to a first of said comparators, said first comparator being responsive to said first thermosensitive element to produce a first signal for controlling the average energy output of said burner and for establishing a maximum temperature limit, a second thermosensitive element connected to a second comparator, said second comparator being responsive to said second thermosensitive element to produce a second signal in response to

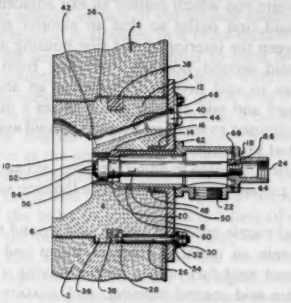
the presence of a flame in the burner, a third comparator being connected with said first comparator for establishing a time interval during ignition of said flame during which a signal produced by said second thermosensitive element is non-functional, and means connecting said first and second signals to a fourth comparator, said fourth comparator being responsive thereto to produce a third signal only when said first and second signals are in a predetermined condition, and means connected with said fourth comparator for receiving said third signal and operating in resonse thereto to control the fuel supply to said burner.

4,125,358
OIL BURNER
Thomas R. Backus, Port Rowan, Canada
Filed Jan. 25, 1977, Ser. No. 762,318
Claims priority, application Canada, Jan. 30, 1976, 244843
Int. Cl.[2] F23D *11/04*
U.S. Cl. 431—168 **3 Claims**



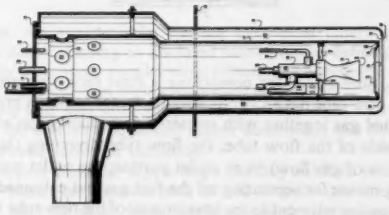
1. An oil burner comprising;
a hollow container;
a rotary burner element mounted for rotation within the container, the element being of fan-like form, having an upper portion, a lower portion and radially extending vanes, said upper portion of the rotary burner element comprising an upper annulus, radially extending, depending rectangular vanes secured thereto, and a lower and smaller disc mounted on the lower inner corners of the rectangular vanes, and the lower portion and the upper portion being separated from one another;
an oil feed pipe for feeding oil fuel to the upper portion of the element as the element is rotated, to cause atomization and radially outward movement of the oil fuel to the periphery of the rotating element;
air inlet means below the lower portion of the rotary burner element and comprising a hollow tube extending from an aperture in the bottom wall of the container to the vicinity of the lower portion of the rotary burner element, and provided with means for adjusting the size of the aperture;
the element being adapted to draw air to its lower portion and move it radially outwardly of the element to mix with the atomized or vaporized fuel in the vicinity of the periphery of the element as the element rotates;
means for firing the mixture of fuel and air to burn in the vicinity of the rotating element;
the rotating element being so constructed and arranged as to cause recirculation of the burning fuel air mixture around the rotating element.

4,125,359
BURNER ASSEMBLY
Roman F. Lempa, Philadelphia, Pa., assignor to Selas Corporation of America, Dresher, Pa.
Filed Jun. 29, 1977, Ser. No. 810,966
Int. Cl.[2] F23C *5/28*
U.S. Cl. 431—175 **17 Claims**



1. In a burner assembly of the type comprising a refractory burner block inserted into a cavity of a furnace housing and wherein said burner block is shaped to mate with the cavity to form a burner block — cavity interface and an inner wall with a generally cup shaped depression formed therein to face the furnace interior and an outer wall to face the furnace exterior, a pilot bore extending through the burner block to facilitate lighting of the burner, the block further including a bore extending therethrough from the cup shaped depression through the outer wall, and wherein a plate is provided to cover the outer wall of the burner block, the improvement comprising:
(a) resilient means for resiliently connecting said plate and said burner block to adjustably compensate for the thermal contraction and expansion of said burner block and said plate to prevent uneven stress loads on said cup shaped depression;
(b) a step joint located on said block surface sides along said interface to reduce the possibility of gaps opening up and to prevent radiant heat and convection flow;
(c) a collar mounted on said plate, said collar coaxially disposed in said bore; and
(d) a plenum chamber located adjacent said cup shaped depression and defining a counter bore coaxial with and of larger diameter than said pilot bore, said plenum chamber to buffer said pilot bore from said burner to prevent pilot blowout.

4,125,360
STEAM ATOMIZING BURNER
James F. Culbertson, San Carlos, Calif., assignor to Envirotech Corporation, Menlo Park, Calif.
Filed Oct. 28, 1976, Ser. No. 736,621
Int. Cl.[2] F23C *5/08*
U.S. Cl. 431—187 **15 Claims**



1. A combustion apparatus comprising:

a. a first tubular housing having a closed end and an opposite open end whereat an inwardly directed lip is formed to define a first outlet;

b. an aperture means for admitting air to said first housing spaced from said first outlet;

c. a second tubular housing fixedly mounted within said first housing, said second housing having a closed end and an opposite end which defines an exit adjacent and enclosed by said first outlet so that an annular space is defined between the interior of said first housing and the exterior of said second housing extending from said aperture means to said first outlet whereat an annular orifice is formed and said annular space passes a major portion of air admitted to said first housing by said aperture means to emit at said orifice;

d. means connected to admit air from said annular space into said second tubular housing at a location spaced from said exit;

e. a fuel nozzle mounted within said second tubular housing wherein an initial mixture of steam and a fluid fuel is formed; said fuel nozzle further having a mixture outlet within said second housing, said mixture outlet to emit said initial mixture in a direction toward said exit and a confluence with said major portion of air; said major portion providing air for combusting said initial mixture; and

f. a turbulator ring fixedly mounted within said second housing at said exit between said mixture outlet and said exit thereby to define a sharp-edged orifice with respect to said emitted initial mixture from said mixture outlet and to define a narrow annular orifice between said tubulator ring and the interior of said second housing.

4,125,361

BAFFLE

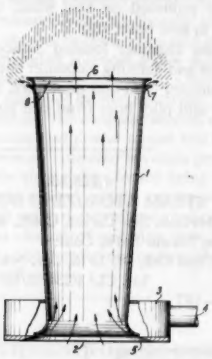
Ronald L. Bourn, Cowes, England, assignor to The British Petroleum Company Limited, Sunbury-on-Thames, England

Filed Oct. 28, 1976, Ser. No. 736,312

Claims priority, application United Kingdom, Nov. 12, 1975, 46688/75

Int. Cl.[2] F23D *13/40*

U.S. Cl. 431—354 **14 Claims**



1. A burner element comprising a flow tube, one end of which flow tube has a Coanda nozzle adapted to pass a pressurised fuel gas together with entrained surrounding gas along the inside of the flow tube, the flow tube diverging (in the direction of gas flow) to an outlet portion, the outlet portion having means for separating off the fuel gas and entrained gas layer passing adjacent to the interior wall of the flow tube from the central gas flow and for deflecting the fuel gas and entrained gas layer outwardly from the central gas flow.

4,125,362

HEAT ROLLER AND TONER IMAGE FIXING DEVICE MADE THEREWITH

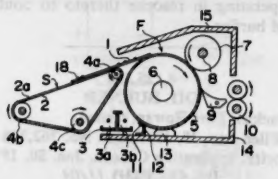
Toshio Matsui, Toyokawa, and Nobuo Kitou, Hoi, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Filed Apr. 26, 1977, Ser. No. 790,874

Claims priority, application Japan, Apr. 28, 1976, 5148988

Int. Cl.[2] G03G *13/08*; B05C *11/00*

U.S. Cl. 432—60 **20 Claims**



1. In a toner image-fixing device which includes a preliminary means for thermally treating a toner image on a surface of a copy sheet to transform it into a semi-fixed state and a heat roller which contacts the surface of the copy sheet on which the semi-fixed toner image is located in order to completely fix the toner image,

the improvement wherein the heat roller which contacts the semi-fixed toner image is made of RTV silicone rubber containing 25 to 35% by weight of chemically combined silicone oil such that thermal fixing of the toner image can be achieved without causing offset of the toner image onto the surface of the heat roller and without jamming or undesirable sticking of the copy material to the surface of the heat roller.

4,125,363

ROTARY KILN PLANT

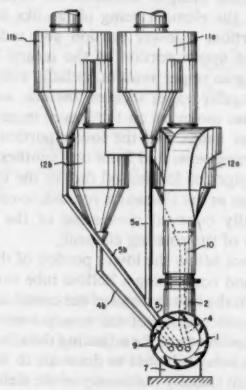
Dan S. Hansen, Copenhagen Valby, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Oct. 13, 1976, Ser. No. 731,983

Claims priority, application United Kingdom, Oct. 15, 1975, 42221/75; Nov. 19, 1975, 47632/75; Feb. 4, 1976, 4362/76

Int. Cl.[2] F27B *7/02*

U.S. Cl. 432—106 **39 Claims**



1. A plant for heat treating pulverous raw material which comprises:

(a) a kiln having an upper material inlet end portion and a lower material outlet end portion;

(b) at least one multi-stage raw material string preheater having at least a first stage for receiving raw material to be

preheated and a last stage communicating with the upper material inlet end portion of the kiln;

(c) a smoke conduit communicating the upper material inlet end portion of the kiln with the preheater;

(d) a chamber communicating the upper material inlet end portion of the kiln with the smoke conduit and adapted to receive preheated material from at least one preheater stage;

(e) means for feeding to said chamber, preheated material from at least one preheater stage preceding the last stage of the asssociated preheater string;

(f) means positioned at least partially within said chamber for dispersing the material received therein into the hot gases exiting the material inlet end portion of the kiln so as to be suspended by said gases passing therethrough and at least partially calcined while being directed through said smoke conduit to the last stage of said preheater string; and

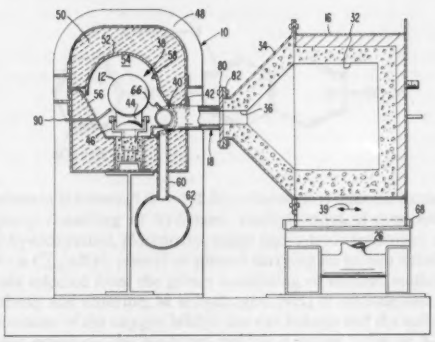
(g) means for feeding said preheated, at least partially calcined material from the last stage of each preheater string to the upper material inlet end portion of the kiln at a location upstream with respect to the kiln exit gases, of the location of said chamber so as to pass down through the kiln for further heat treatment.

4,125,364

HIGH VELOCITY BILLET HEATER

Wilbur E. Stephens, Redwood City, Calif., assignor to Alumax, Inc., San Mateo, Calif.

Continuation of Ser. No. 669,239, Mar. 22, 1976, abandoned.
This application Apr. 7, 1977, Ser. No. 785,520
Int. Cl.[2] F27B *9/22, 9/40*
U.S. Cl. 432—145 **3 Claims**



1. An improved billet heater of the type having an elongated, heated furnace and means for transporting an elongated metal billet through the length of the furnace wherein the improvement comprises:

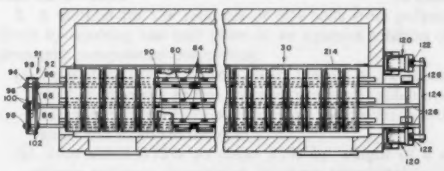
a plurality of combustion unit means located exteriorly of the furnace and spaced along its length for injecting combusted, hot gas into the furnace chamber at a velocity between 100 to 400 feet per second and at a temperature of at least 800° F. generally tangential to the exterior surface of the billet and non-parallel to its length, and wherein the combustion units each include a cylindrical combustion chamber, a high pressure air supply connected to feed air into the combustion chamber sufficient to produce a pressure of at least 15 ounces per square inch gauge, means for introducing combustible fuel into the combustion chamber in a direction tangential to the interior circumference of the chamber, and nozzle means connected to the combustion chamber for injecting completely combusted high temperature gas from the combustion chamber into the furnace chamber tangentially against the billet, and wherein the interior surface of the furnace chamber has a generally irregular oval shape in a cross-section perpendicular to the length of the chamber to form an annular space surrounding the length of the billet whereby a venturi effect is created by the annular space which wraps a vortex of hot gas around the billet to heat it convectively, wherein the interior of the combustion chamber has a conical taper at the point where it connects to the nozzle means, further comprising means for adjusting the lateral position of the nozzle means with respect to the longitudinal axis of the billet to accommodate billets of different diameters, the billet heater further being of the type in which the fuel and air supplied to the combustion unit means are regulatable in response to a signal from a temperature sensor mounted within the furnace chamber so as to vary the temperature of the hot gas injected into the furnace chamber and wherein the improvement further comprises temperature responsive means mounted within the furnace chamber but closely spaced from the billet for determining the temperature of that portion of the hot gas vortex surrounding the billet which is nearest to the billet's surface and for generating a control signal for regulating the temperature of the hot gas injected into the furnace chamber by controlling the amount of the fuel and air supplied to the combustion unit means.

4,125,365

ROLL THROUGH BILLET HEATER

John W. Nelson, Wyoming, Mich., assignor to Oliver Machinery Company, Grand Rapids, Mich.

Filed Apr. 7, 1977, Ser. No. 785,516
Int. Cl.[2] F27B *9/04, 9/14*
U.S. Cl. 432—152 **22 Claims**



20. An apparatus for heating cylindrical billets prior to extrusion including an insulated tunnel, means defining a plurality of spaced, parallel slots extending transversely of said tunnel, a source of high temperature pressurized air communicating with said slots, and an improved conveyor for conveying the billets through said tunnel underneath said slots, said improved conveyor including:

support means for supporting a plurality of billets within said tunnel one beneath each of said slots for direct impingement by an air jet issuing from said slot and extending in a spaced, side-by-side relationship transverse to said tunnel; and

means for rolling said billets in a step-like fashion along said support means and between adjacent slots.

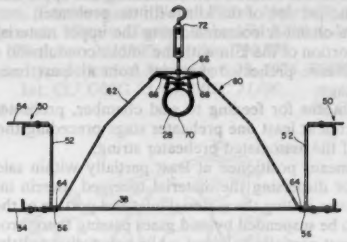
4,125,366

INFRA-RED HEATED SPRAY PAINT BOOTH

Ivan M. Boyer, P.O. Box 670, Spearfish, S. Dak. 57783

Filed Apr. 19, 1977, Ser. No. 788,981
Int. Cl.[2] F26B *3/30*
U.S. Cl. 432—209 **12 Claims**

1. A plurality of radiant heating assemblies adapted to be mounted on and extending substantially the entire length of a paint spray booth, each heating assembly adapted to be positioned on the roof of the booth and comprising a radiant pipe for emitting infra-red energy, a reflector member spaced at the sides of said radiant pipe and reflecting infra-red energy downwardly into the booth, and a glass panel below said radiant pipe and through which said infra-red energy is transmitted, means for supplying combustion gases to said pipe and exhausting spent gases therefrom, and heater means associated with at least two radiant pipes, said reflector member and said glass panel partially defining a sealed chamber in which said pipe is enclosed.

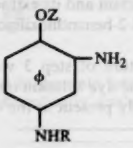


4,125,367
METAPHENYLENEDIAMINES AND DYEING COMPOSITIONS CONTAINING THE SAME

Andrée Bugaut, Boulogne, and Jean-Jacques Vandenbossche, Aulnay, both of France, assignors to L'Oreal, Paris, France

Filed Sep. 13, 1976, Ser. No. 722,819
Claims priority, application France, Aug. 20, 1976, 76 25387
Int. Cl.[2] D06P *1/32, 3/06;* A61K *7/12*
U.S. Cl. 8—11 **32 Claims**

1. A dyeing composition for keratinic fibers and human hair, said composition containing in aqueous solution a dyeing amount of at least 1 oxidation base that contains as a coupler, at least 1 compound according to having the general formula (I):



(I)

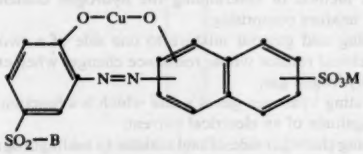
in which R is selected from the group consisting of hydrogen, alkyl or hydroxyalkyl having 1 to 3 carbon atoms, and in which Z is selected from the group consisting of hydroxyalkyl, alkoxyalkyl in which the alkoxy group comprises 1 to 2 carbon atoms, mesylaminoalkyl, acetylaminoalkyl, ureidoaminoalkyl or carbethoxyaminoalkyl, the alkyl groups constituting Z comprising from 2 to 3 carbon atoms, or the salts of the corresponding acids.

4,125,368
METALLIZED MONOAZO DYES

Hans A. Stingl, Toms River, and John Elliott, Pine Beach, both of N.J., assignors to Toms River Chemical Corp., Toms River, N.J.

Division of Ser. No. 475,225, May 31, 1974, Pat. No. 4,058,515, which is a continuation of Ser. No. 257,645, May 30, 1972, abandoned. This application Sep. 12, 1977, Ser. No. 832,129
Int. Cl.[2] C09B *45/00, 45/18*
U.S. Cl. 8—42 B **5 Claims**

1. Polyamide fibers dyed with a compound of the formula



wherein B is benzyl or —NRR_1, wherein R is selected from the group consisting of hydrogen, methyl, ethyl, β-cyanoethyl, β-hydroxyethyl, β-hydroxypropyl and γ-hydroxypropyl; and R_1 is C_{2-8}-alkyl, phenyl or phenyl carrying up to two substituents selected from the group conssisting of methyl, methoxy, ethoxy and chlorine; M is hydrogen, NH_4 or sodium; and the positions of the oxygen bridge, the azo linkage and the sulfonic acid group on the naphthol residue is either 1-2-4 or 2-1-6, respectively.

4,125,369
PERMANENT TOPICAL TEXTILE ANTISTATS

Brenda J. Reder-James, Inglewood, Calif., and Sally P. Ginter, Sanford, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 28, 1977, Ser. No. 781,826
Int. Cl.[2] C08L *61/28;* D06M *15/56*
U.S. Cl. 8—115.6 **13 Claims**

1. A topical antistatic composition for use on a textile to impart antistatic properties thereto, said composition comprising:

(a) a polymer of less than about 20,000 molecular weight consisting essentially of units of the formula:

—CH_2CHRO—

wherein about 10 percent to 99 percent of the units R is H, CH_3 or C_2H_5, in about 1 percent to 90 percent R is CH_2OH, and in about 0 percent to 15 percent R is $R'COOCH_2$, wherein R'CO is the acyl radical of a fatty acid of about 2 to 20 carbon atoms or a polycarboxylic acid,

(b) a melamine-formaldehyde curing agent for said polymer having a plurality of groups reactive with primary hydroxyl groups, and

(c) a sulfonic acid catalyst that catalyzes the reaction between the polymer and the curing agent, wherein component (b) is present in the amount of about 15 to about 25 percent, and component (c) is present in the amount of about 1.2 to about 2.2 percent, based on the weight of component (a).

7. A process for reducing the tendency of a textile to accumulate an electric charge comprising:

(a) applying to the textile a polymer of less than about 20,000 molecular weight consisting essentially of units of the formula:

—CH_2CHRO—

wherein about 10 percent to 99 percent of the units R is H, CH_3 or C_2H_5, in about 1 percent to 90 percent R is CH_2OH and in about 0 percent to 15 percent R is $R'COOCH_2$, wherein R'CO is the acyl radical of a fatty acid of about 2 to 20 carbon atoms or a polycarboxylic acid; in admixture with about 15 to about 25 weight percent of a melamine-formaldehyde curing agent and about 1.2 to about 2.2 weight percent of a sulfonic acid catalyst, both based on the polymer, and

(b) curing said polymer on the textile by heating.

4,125,370
LAUNDRY METHOD IMPARTING SOIL RELEASE PROPERTIES TO LAUNDERED FABRICS

Charles H. Nicol, Hamilton, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 699,412, Jun. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 677,350, Apr. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 482,948, Jun. 25, 1974, abandoned. This application Nov. 30, 1977, Ser. No. 856,076
Int. Cl.[2] D01F *11/00;* D06L *1/00*
U.S. Cl. 8—137.5 **10 Claims**

1. A method for the removal of oily soils from polyester fibers by washing and said fibers in an aqueous solution of a detergent composition comprising:

(a) from about 2% to about 95% by weight of a surfactant selected from the group consisting of water-soluble anionic, nonionic, zwitterionic and ampholytic surface-active agents and mixtures thereof;

(b) from about 0.15% to about 25% by weight of a soil release polymer comprising ethylene terephthalate and polyethylene oxide terephthalate at a molar ratio of ethylene terephthalate to polyethylene oxide terephthalate of from about 20:80 to about 90:10, said polyethylene oxide terephthalate containing polyethylene oxide linking units having a molecular weight of from about 300 to 10,000, the molecular weight of said soil release polymer being in the range of from about 5,000 to about 200,000; and

(c) from about 0.05% to about 10.0% of a component which dissociates, in aqueous solution, yielding cations selected from the group consisting of lithium, potassium, alkaline earth, zinc, quaternary ammonium cations and mixtures thereof; and

wherein at least 20% of said detergent composition is comprised of surface-active agent and detergency builder components.

4,125,371

PROCESS FOR THE LEVEL, ISOTHERMAL HIGH-TEMPERATURE DYEING OF HYDROPHOBIC SYNTHETIC FIBERS WITH DISPERSE DYESTUFFS

Helmut Beutler, and Joachim W. Lehmann, both of Kelkheim, Taunus, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 30, 1976, Ser. No. 710,139

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1975, 2534562

Int. Cl.[2] D06P *3/00*; D06B *23/24, 23/28*

U.S. Cl. 8—176 **6 Claims**

1. A process for the isothermal high-temperature dyeing of textile material made of hydrophobic synthetic fibers in a closed dyeing system with water-insoluble disperse dyestuffs according to the exhaustion method, according to which the disperse dyestuff predispersed in water of 40° to 60° C is introduced into an aqueous bath free of dyestuffs which is already circulating to form a bath liquor, and heated together with the textile material to a dyeing temperature within the range of from 115° C to 140° and adjusted to pH 4 – 6, which comprises measuring the bath liquor circulation rate and the amount of dyestuff exhausted onto the fiber, and introducing the predispersed dyestuff in doses into the dye bath liquor depending on the measured rate and the amount of dyestuff exhausted to replace the dyestuff exhausted such that 1% to 4% of the total dyestuff to be introduced is added per one bath liquor circulation.

4,125,372

METHOD AND DEVICE FOR TESTING LIQUIDS

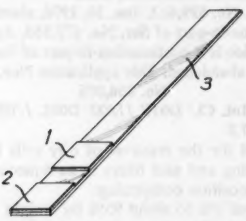
Shoji Kawai, Kyoto; Shigeki Yamada, and Shinichi Kishimoto, both of Uji, all of Japan, assignors to Kabushiki Kaisha Kyoto Kaiichi Kagaku, Japan

Filed Mar. 19, 1976, Ser. No. 668,745

Claims priority, application Japan, Apr. 1, 1975, 50-40007

Int. Cl.[2] G01N *21/06, 21/20, 31/22, 33/16*

U.S. Cl. 23—230 B **12 Claims**



1. A device for testing a liquid for aiding in the detection of a substance in the liquid, comprising a pair of liquid-absorbent bodies one of which is a test body and the other of which is a reference body, said bodies being made of materials which have substantially identical characteristics with respect to the liquid to be tested for reacting therewith to be colored identically thereby and to have the same light-reflecting properties except that the material of said test body differs from that of said reference body in that the material of said test body is capable of giving a color indication of said substance, and means connected with said bodies for facilitating the dipping thereof into and the removal thereof from a liquid which is to be tested, whereby after thus removing the bodies from the liquid a comparison of the colors thereof will provide the desired information.

4,125,373

MEASUREMENT OF TRACE ETHYLENE GLYCOL IN OIL

Myles W. Scoggins, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 29, 1977, Ser. No. 811,357

Int. Cl.[2] G01N *21/26, 31/22, 33/28*

U.S. Cl. 23—230 HC **5 Claims**

1. A method for determining the presence of ethylene glycol in motor oil said method comprising:

(1) extracting a sample of said motor oil using water as extractant,

(2) contacting the water extractant and its extracted contents with trisodium paraperiodate,

(3) contacting the extractant and its extracted contents from step 2 with 3-methyl-2-benzothiozilinone hydrazone hydrochloride, and

(4) contacting the mixture of step 3 with ferric chloride thereby forming a blue dye solution indicating that ethylene glycol was initially present in the oil sample.

4,125,374

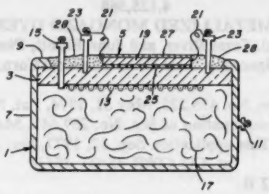
METHOD AND APPARATUS FOR DETERMINING COMBUSTION MIXTURE AIR/FUEL RATIO

James D. Bode, Royal Oak; William G. Wolber, Southfield; Paul A. Michaels, Livonia, and Charles J. Ahern, Lathrup Village, all of Mich., assignors to Bendix Autolite Corporation, Fostoria, Ohio

Filed Nov. 21, 1977, Ser. No. 853,158

Int. Cl.[2] G01N *27/12*

U.S. Cl. 23—232 E **25 Claims**



21. A method of determining the hydrogen content of a gaseous mixture comprising:

exposing said gaseous mixture to one side of a two sided electrical resistor whose resistance changes when exposed to hydrogen gas;

generating hydrogen gas at a rate which is a function of the magnitude of an electrical current;

exposing the other side of said resistor to said hydrogen gas;

measuring the resistance of said resistor;

generating said electrical current as a function of the resistance of said resistor; and

providing an output signal which is a function of said electric current.

4,125,375

SEPARATION OF SOLID AND LIQUID COMPONENTS OF MIXTURES

William M. Hunter, Edinburgh, Scotland, assignor to National Research Development Corporation, London, England

Filed Nov. 10, 1976, Ser. No. 740,485

Claims priority, application United Kingdom, Nov. 14, 1975, 47078/75

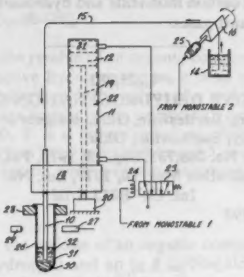
Int. Cl.[2] G01N *33/16*

U.S. Cl. 23—230 B **15 Claims**

1. A separating and analyzing method including separating solid and liquid components of a mixture comprising;

delivering to the mixture a second liquid, having a density intermediate between those of the solid and liquid compo-

nents of the mixture, to form a discrete layer above or below the mixture;



allowing the solid to separate into the layer of the second liquid; and, automatically analyzing the solid or liquid components.

4,125,376

METHOD FOR DETECTING WATER POLLUTANTS

Marie K. Razulis, Randallstown, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 22, 1977, Ser. No. 789,768
Int. Cl.[2] B01L *3/14*; G01N *33/18*
U.S. Cl. 23—230 R **14 Claims**

1. A method for qualitatively determining the presence of specific pollutants selected from the group consisting of hazardous heavy metal compounds in water comprising the steps of providing a test sample tube containing a foam cube impregnated with a detection chemical solution which is selected to react with said (specific) pollutants, adding a sample of the water to be tested, stoppering and then shaking the tube to produce a colorimetric reaction, and noting the color change to indicate the presence of specific known pollutants.

4,125,377

DETERMINATION OF TRIGLYCERIDES

E. Melvin Gindler, Rockford, Ill., assignor to Pierce Chemical Company, Rockford, Ill.

Continuation of Ser. No. 747,357, Dec. 3, 1976, abandoned. This application Nov. 25, 1977, Ser. No. 854,792
Int. Cl.[2] G01N *33/16*
U.S. Cl. 23—230 B **9 Claims**

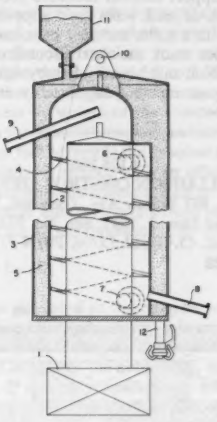
1. In a process for forming a colored derivative of an aldehyde by means of the Hantzsch condensation reaction whereby (one mole) a molecule of aldehyde is reacted in solution with two (moles) molecules of a beta-dicarbonyl compound in the presence of ammonia to yield, as said colored derivative, a lutidine; the improvement wherein, during said reaction, said solution also contains an orgainc accelerator compound dissolved therein which is effective to permit said Hantzsch reaction to be analytically complete within 15 minutes at 37° C., said compound being capable of forming a clear solution with the mixture of components of the reaction solution and being further characterized as having an aprotic internal dipole such that said compound has a distinct center which is electron rich and a center which is electron deficient.

4,125,378

VIBRATORY CHEMICAL REACTOR HAVING INSULATION WHICH ACQUIRES AN ELECTROSTATIC CHARGE DURING VIBRATION

Hans von Döhren, Ratzeburg-Bük, Fed. Rep. of Germany, assignor to Varta Batterie Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 29, 1977, Ser. No. 837,925
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1976, 2645185
Int. Cl.[2] B01J *8/16*; C04B *35/10, 35/16, 43/00*
U.S. Cl. 422—202 **8 Claims**



1. A vibratory chemical reactor having an enclosure containing a heat flow impeding material with a predetermined compaction density wherein

the heat flow impeding material is temperature stable, water free, and powdery, and

the particles of said material are electrostatically charged relative to the surrounding gaseous medium when subjected to vibrations from said reactor,

whereby the predetermined compaction density of the material is maintained during operation of the reactor due to the electrostatic charge carried by said particles.

4,125,379

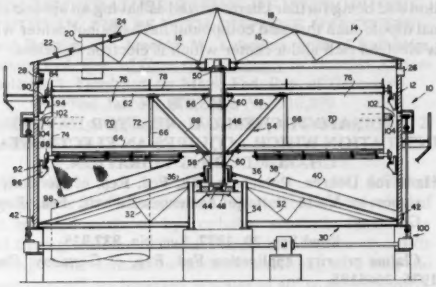
APPARATUS FOR SOLVENT EXTRACTION

Arthur F. Saxon, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Aug. 25, 1976, Ser. No. 717,635
Int. Cl.[2] B01D *11/02*
U.S. Cl. 422—269 **3 Claims**

1. In a solvent extractor including a vapor tight vessel in which is disposed a plurality of cells formed by a plurality of radially extending walls arranged in circumferential fashion on a generally horizontal plane around a vertical extending rotor, a feed conduit for introducing into said cells solids to be treated, a solids-retaining bottom closure for each cell, a track

to maintain said bottom closures in substantially closed position during a predetermined section of a rotational path of each cell, conduits for successively introducing a solvent into said cells from above said predetermined section of said rotational path, a liquid collection zone disposed beneath said cells and including a plurality of compartments for receiving solvent, the improvement characterized by:



providing said radially extending walls with a horizontally extending support member mounted about the upper portion of each of said walls, said support member being provided with a roller member proximate to said vessel; and an upper track member circumferentially disposed internally about said vessel whereby said roller members of said support member supportably engage said upper track member.

4,125,380

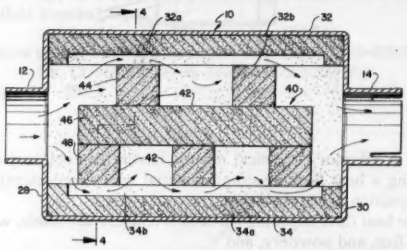
POLLUTION CONTROL DEVICE

Carmine Negola, 557 Willow Ave., Garwood, N.J. 07027

Filed Mar. 2, 1977, Ser. No. 773,521

Int. Cl.[2] B01J *35/04;* F01N *3/10*

U.S. Cl. 422—180 **9 Claims**



1. An antipollution device for substantially reducing the carbon monoxide and hydrocarbons produced by the exhaust from a vehicle having a combustion engine and an exhaust pipe, comprising:

a container having an inlet and an outlet at opposite ends thereof, said inlet adapted to be connected to the engine manifold of a combustion engine and said outlet adapted to be connected to the exhaust pipe so that exhaust gases flow in a substantially longitudinal direction between said inlet and said outlet;

the walls of said container being lined with a castable refractory material containing a binder resistant to high temperature, silica, and fire clay;

said container further including a stacked array of members formed of said castable refractory material;

said stacked array including layers of members wherein alternate layers are longitudinally and transversely arranged in said container to form a grid having passageways between said lined walls and said members;

said passageways extending between said inlet and said outlet so that the exhaust gases from said engine pass through said passageways and operate to substantially reduce the carbon monoxide and hydrocarbons contained in the exhaust gases.

4,125,381

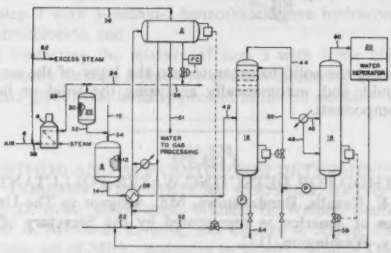
OXIDATIVE DEHYDROGENATION SYSTEM

Ronald S. Rogers, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 288,731, Sep. 13, 1972, Pat. No. 4,021,500. This application Mar. 14, 1977, Ser. No. 777,186

Int. Cl.[2] B01J *8/02*

U.S. Cl. 422—190 **2 Claims**



1. In an oxidative dehydrogenation process apparatus for converting a hydrocarbon feed stream comprising a steam drum, means for passing steam from the steam drum and air into a furnace, a dehydrogenation reactor for receiving the heated air and steam stream from the furnace and a hydrocarbon feed stream, converting the hydrocarbon feed stream therein and discharging an effluent stream from the reactor, said effluent stream comprising water, dehydrogenated hydrocarbon, oxygenated hydrocarbon derivatives, and unconverted hydrocarbon, means for separating water from the reactor effluent, means for passing the separated water through a steam generator to the steam drum, and a conduit connected to the steam drum for removing water therefrom, the improvement comprising:

an oxidation reactor connected to the conduit for receiving separated water from the steam drum;

means for passing the heated air and steam from the furnace into the oxidation reactor;

means within the oxidation reactor for converting organic compounds in the separated water to carbonaceous gas, said means comprising a catalyst; and

means for passing the treated water from the oxidation reactor into the dehydrogenation reactor.

4,125,382

FUELS CONTAINING POLYOXYALKYLENE ETHER DEMULSIFIERS

Edward F. O'Brien, Woodhaven, and William K. Langdon, Grosse Ile, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Apr. 11, 1977, Ser. No. 786,138

Int. Cl.[2] C10L *1/18;* B01D *17/04*

U.S. Cl. 44—51 **20 Claims**

1. A fuel composition comprising a major amount of a liquid hydrocarbon fuel boiling in the gasoline range said full containing a detergent additive and a demulsifier, in an amount sufficient to inhibit emulsion formation of said fuel with water, said demulsifier selected from the group of polyoxyalkylene ether compounds derived from a mixture of ethylene oxide and propylene oxide and terminated with acetal or ester groups, said ester derived from the reaction of said ether with an alkyl carboxylic acid having from 8 to 20 carbon atoms and wherein

said polyoxyalkylene ether compounds are selected from the group represented by the formulas:

$$X[(C_3H_6O)_n—E—H]_x \quad (a)$$

wherein X is the residue of an organic compound containing therein x active hydrogen atoms, n is an integer, x is an integer greater than 1, the values of n and x are such that the molecular weight of the compound, exclusive of E, is at least 900, E is a polyoxyalkylene chain wherein the oxygen/carbon atom ratio is at least 0.5, and E constitutes 20–90 percent by weight of the compound,

$$Y(PK)_yH_y \quad (b)$$

wherein Y is the residue of an organic compound having y reactive hydrogens and up to 6 carbon atoms, P is a hydrophobic polyoxyalkylene chain having an oxygen/carbon atom ratio of not more than 0.40, the molecular weight of P and the value of y being such that the molecule excluding K has a molecular weight of at least about 400 to 900 and up to about 25,000 and K is a hydrophilic polyoxyalkylene chain which (1) contains oxyethylene groups and at least 5 percent by weight of higher molecular weight oxyalkylene groups having at least 3 carbon atoms in their structure, and (2) has an average oxygen/-carbon atom ratio of greater than 0.40, K being present in the composition in an amount sufficient to constitute from about 10 percent to about 90 percent by weight of the total composition, and

$$RO(A)_mH \quad (c)$$

wherein R is a straight chain alkyl group having from 8 to 20 carbon atoms, A is a mixture of oxypropylene and oxyethylene groups, the oxypropylene to oxyethylene ratio of said total weight being from 0.5:1 to 2.75:1, and m is an integer such that the oxyalkylene groups constitute from 55 to 80 percent by weight of the compound.

4. A fuel composition comprising a major amount of a liquid hydrocarbon fuel boiling in the gasoline range and a demulsifier, in an amount sufficient to inhibit emulsion formation of said fuel with water, said demulsifier selected from the group of polyoxyalkylene ether compounds coupled with an acetal or a carbonate group wherein said polyoxyalkylene ether compounds are represented by the formula

$$RO(A)_mH$$

wherein R is a straight chain alkyl group having from 8 to 20 carbon atoms, A is a mixture of oxypropylene and oxyethylene groups, the oxypropylene to oxyethylene ratio of said total weight being from 0.5:1 to 2.75:1, and m is an integer such that the oxyalkylene groups constitute from 55 to 80 percent by weight of the compound.

7. A fuel composition comprising a major amount of a liquid hydrocarbon fuel boiling in the gasoline range and a demulsifier in an amount sufficient to inhibit emulsion formation of said fuel with water, said demulsifier being a 1:1 mole adduct of a C_8–C_{18} epoxide with a polyoxyalkylene ether compound.

11. A process for demulsifying an emulsion consisting of a liquid hydrocarbon fuel boiling in the gasoline range said fuel containing a detergent additive and water wherein said emulsion is treated with an effective amount of polyoxyalkylene ether compounds derived from a mixture of ethylene oxide and propylene oxide and terminated with acetal or ester groups, said ester derived from the reaction of said ether with an alkyl carboxylic acid having from 8 to 20 carbon atoms and wherein said polyoxyalkylene ether compounds are selected from the group represented by the formulas:

$$X[(C_3H_6O)_n—E—H]_x \quad (a)$$

wherein X is the residue of an organic compound containing therein x active hydrogen atoms, n is an integer, x is an integer greater than 1, the values of n and x are such that the molecular weight of the compound, exclusive of E, is at least 900, E is a polyoxyalkylene chain wherein the oxygen/carbon atom ratio is at least 0.5, and E constitutes 20–90 percent by weight of the compound,

$$Y(PK)_yH_y$$

wherein Y is the residue of an organic compound having y reactive hydrogens and up to 6 carbon atoms, P is a hydrophobic polyoxyalkylene chain having an oxygen/carbon atom ratio of not more than 0.40, the molecular weight of P and the value of y being such that the molecule excluding K has a molecular weight of at least about 400 to 900 and up to about 25,000 and K is a hydrophilic polyoxyalkylene chain which (1) contains oxyethylene groups and at least 5 percent by weight of higher molecular weight oxyalkylene groups having at least 3 carbon atoms in their structure, and (2) has an average oxygen/-carbon atom ratio of greater than 0.40, K being present in the composition in an amount sufficient to constitute from about 10 percent to about 90 percent by weight of the total composition, and

$$RO(A)_mH$$

wherein R is a straight chain alkyl group having from 8 to 20 carbon atoms, A is a mixture of oxypropylene and oxyethylene groups, the oxypropylene to oxyethylene ratio of said total weight being from 0.5:1 to 2.75:1, and m is an integer such that the oxyalkylene groups constitute from 55 to 80 percent by weight of the compound.

14. The process for demulsifying an emulsion consisting of a liquid hydrocarbon fuel boiling in the gasoline range and water wherein said emulsion is treated with an effective amount of polyoxyalkylene compounds coupled with an acetal or a carbonate group wherein said polyoxyalkylene ether compounds are selected from the group represented by the formulas:

$$X[(C_3H_6O)_n—E—H]_x \quad (a)$$

wherein X is the residue of an organic compound containing therein x active hydrogen atoms, n is an integer, x is an integer greater than 1, the values of n and x are such that the molecular weight of the compound, exclusive of E, is at least 900, E is a polyoxyalkylene chain wherein the oxygen/carbon atom ratio is at least 0.5, and E constitutes 20–90 percent by weight of the compound,

$$Y(PK)_yH_y \quad (b)$$

wherein Y is the residue of an organic compound having y reactive hydrogens and up to 6 carbon atoms, P is a hydrophobic polyoxyalkylene chain having an oxygen/carbon atom ratio of not more than 0.4, the molecular weight of P and the value of y being such that the molecule excluding K has a molecular weight of at least about 400 to 900 and up to about 25,000 and K is a hydrophilic polyoxyalkylene chain which (1) contains oxyethylene groups and at least 5 percent by weight of higher molecular weight oxyalkylene groups having at least 3 carbon atoms in their structure, and (2) has an average oxygen/carbon atom ratio of greater than 0.40, K being present in the composition in an amount sufficient to constitute from about 10 percent to about 90 percent by weight of the total composition, and

$$RO(A)_mH \quad (c)$$

wherein R is a straight chain alkyl group having from 8 to 20 carbon atoms, A is a mixture of oxypropylene and oxyethylene groups, the oxypropylene to oxyethylene ratio of said total weight being from 0.5:1 to 2,75:1, and m is an integer such that the oxyalkylene groups constitute from 55 to 80 percent by weight of the compound.

4,125,383

ASHLESS FUEL DETERGENT ADDITIVES

Hans D. Holtz, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 12, 1976, Ser. No. 676,257
Int. Cl.[2] C10L 1/22; C07C 102/04
U.S. Cl. 44—66 20 Claims

1. A method for producing an ashless fuel detergent additive comprising reacting a long chain monocarboxylic acid, an isocyanate having the formula R"NCO where R" contains 12 to 18 carbon atoms in a straight or branched chain, and a polyamine to produce molecular entities comprising functionalities of urea, amide, and long hydrocarbon chains.

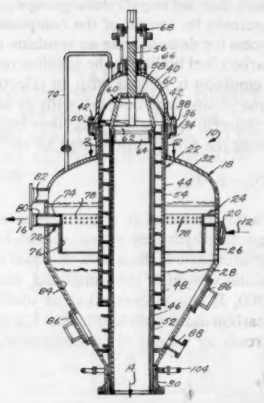
9. A compound useful as an ashless fuel detergent additive prepared by reacting with a monocarboxylic acid the product of the reaction of a polyamine and an isocyanate having the formula R"NCO where R" contains 12 to 18 carbon atoms in a straight or branched chain.

4,125,384

METHOD AND APPARATUS FOR CONTINUOUSLY FEEDING SOLID PARTICLES INTO A PRESSURIZED CONTAINER

Erwin D. Funk, Glens Falls, N.Y., assignor to Kamyr Inc., Glens Falls, N.Y.

Filed Mar. 3, 1977, Ser. No. 774,043
Int. Cl.[2] C10J 3/30
U.S. Cl. 48—86 R 37 Claims



7. Apparatus for continuously feeding solid particles into a pressurized container comprising:

a vessel for confining a body of liquid having a specific gravity less than the specific gravity of said particles in proximity to the pressurized container,

means for maintaining communication of the pressure conditions within said pressurized container with a free surface of the confined body of liquid so as to maintain said body of liquid under pressure,

means for continuously introducing a supply of solid particles entrained in liquid under pressure into the body of liquid under pressure so that the entrained particles will move continuously toward the bottom portion of said body of liquid,

mechanical means for continuously moving the particles in the bottom portion of said body of liquid upwardly along a non-foraminous confined path which extends from a position adjacent the bottom portion of the body of liquid upwardly above the level of the aforesaid free surface thereof to a feed position in pressure communication with the interior of the pressurized container from which the particles can be fed into the pressurized container so that the entraining liquid filling the spaces between the solid particles being moved upwardly will drain from the particles downwardly into the body of liquid during the aforesaid movement of the particles above the free surface of the body of liquid whereby substantially the only liquid retained with said particles as they pass from said feed position and into said pressurized container is that amount which is retained by surface adherance, and

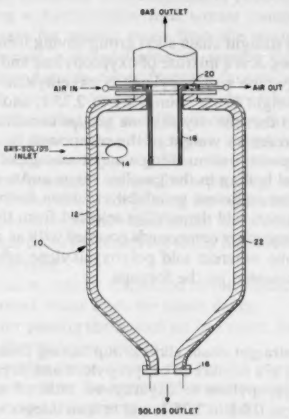
means for continuously withdrawing liquid from said body of liquid at a level at or near the free surface thereof in an amount so related to the amount of particles and entrained liquid introduced thereto and particles removed thereby along said path sufficient to maintain said free surface at a substantially constant level and along a liquid withdrawal flow path arrangement devoid of restrictions of a size less than that necessary to permit free passage thereby of any fine particles entrained in the withdrawn liquid.

4,125,385

CYCLONE SEPARATOR FOR HIGH TEMPERATURE OPERATIONS WITH CORROSIVE GASES

Theodore A. Rado, and Alan J. Morris, both of Oklahoma City, Okla., assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Aug. 1, 1977, Ser. No. 820,407
Int. Cl.[2] B01D 51/00
U.S. Cl. 55—269 5 Claims



1. In apparatus adapted for separating solids from admixture with corrosive halide-containing gases at elevated temperatures within a refractory lined cyclone separator provided with a solids-gas inlet, a solids outlet in a lower portion of said cyclone separator and a gas outlet in an upper portion of said cyclone separator, the entrance of said gas outlet being located below the solids-gas inlet, the improvements which comprise:

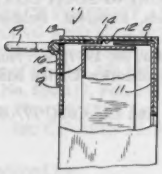
providing the gas outlet which is a non-refractory coated, flanged, hollow, nickel alloy gas outlet having an inner wall and an outer wall, said flange providing support for said gas outlet external of the interior of said refractory lined cyclone separator, said gas outlet being provided with multiple inlets and outlets for cooling fluid arranged around an upper portion of said gas outlet, a pair of partial baffles disposed between the inner and outer walls of said gas outlet to form a pair of communicating circumferential passages within said gas outlet, one of said passages being connected to the multiple inlets for said cooling fluid and the other of said passages being connected to the multiple outlets for said cooling fluid.

4,125,386

HANDLE CONSTRUCTION FOR FILTER FRAME

Emmett J. Philipp, Brookfield, Wis., assignor to Air Filter Corporation, Milwaukee, Wis.

Filed Aug. 11, 1977, Ser. No. 823,841
Int. Cl.[2] B65B *61/00*
U.S. Cl. 55—493 5 Claims



1. A filter frame and handle construction comprising, in combination, a peripheral filter frame extending around and defining an interior filter medium area, said peripheral filter frame including an interior facing surface facing inwardly toward said interior filter medium area,

a filter medium located within said interior filter medium area and the periphery of said filter medium generally confined therein by said peripheral filter frame,

said peripheral filter frame being generally channel shaped in cross section and having a web separating two oppositely spaced legs extending from said web, said oppositely spaced legs projecting inwardly toward said filter medium area so that the opening of said channel shaped filter frame is similarly inwardly directed and said web defines said interior facing surface,

and a handle assembly attached to said peripheral filter frame and including

means defining a slot passing through one of said legs and in general alignment with said interior facing surface,

an anchor plate extending through said slot over and in face to face engagement with a portion of said interior facing surface of said peripheral filter frame and including a hinge portion projecting laterally from said slot,

a handle grip engaged in said hinge portion of said anchor plate whereby it is connected to said anchor plate but is pivotal relative to said anchor plate and said peripheral filter frame,

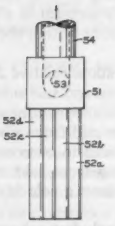
and means for attaching said anchor plate to said interior facing surface in face to face engagement therewith.

4,125,387

HEAT PIPES FOR FIN COOLERS

Charles E. Gunter, Vienna, W. Va., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 19, 1974, Ser. No. 507,314
Int. Cl.[2] C03B *37/02*
U.S. Cl. 65—2 3 Claims



1. A fiber glass forming unit comprising in combination a container for the reception of molten glass, a plurality of orifices on the bottom of said container arranged in parallel rows, vertically stacked rows of pipes positioned between each of the rows of orifices, each of the individual pipes constituting a vertical stacked row having a wick material affixed to the interior surface thereof and defining a central cavity therein, a vaporizable liquid being placed on said wick material in each of said pipes, each of the vertical rows of pipes being mounted in a common header constructed and arranged to provide for fluid coolant flow therethrough and for heat transfer from the point of mounting by indirect heat exchange to the surface of each of said pipes in each of said rows.

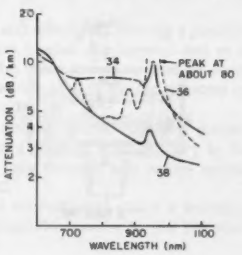
3. A method of cooling glass fibers being drawn from a fiber glass forming unit by attenuation from a plurality of orifices located on the bottom of said fiber glass forming unit in rows comprising: placing below and out of contact with the fiber glass forming unit and between the rows of orifices through which the filaments are being drawn a vertical stack of small pipes for each row, each of said stacks of pipes being mounted in a common header and cooled by indirect heat exchange therewith by a fluid coolant flowing therethrough, providing in each of said pipes a wick material containing vaporizable liquid, the vaporizable liquid in each of the pipes forming a single stacked row of pipes being vaporizable at a different temperature, continuing to draw the glass fibers through the bushing and past the vertical stacked rows of pipes and establishing a temperature gradient along the vertical stacked rows of pipes from the top pipe to the bottom pipe by vaporizing the liquid contained in each of the pipes constituting a single stacked row at different temperatures.

4,125,388

METHOD OF MAKING OPTICAL WAVEGUIDES

Dale R. Powers, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Continuation of Ser. No. 752,464, Dec. 20, 1976, abandoned.
This application Feb. 13, 1978, Ser. No. 877,514
Int. Cl.[2] C03B *37/02*
U.S. Cl. 65—3 A 15 Claims



4. The method of forming a glass article comprising the steps of

depositing on a starting member a coating of flame hydrolysis-produced glass soot to form a porous soot preform,

removing said starting member to form an aperture in said preform,

heating said soot preform to a temperature within the consolidation temperature range for a time sufficient to cause said soot particles to fuse and form a dense glass layer, and

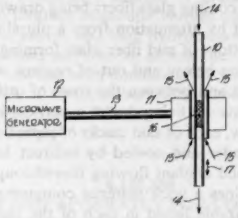
flowing into said aperture a stream of an atmosphere containing a drying agent, at least a portion of said stream flowing outwardly from the center of said preform through the interstices therein to the outer surface thereof.

4,125,389

METHOD FOR MANUFACTURING AN OPTICAL FIBRE WITH PLASMA ACTIVATED DEPOSITION IN A TUBE

Frederick D. King, Smith Falls, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Division of Ser. No. 768,068, Feb. 14, 1977, Pat. No. 4,090,055.
This application Jan. 26, 1978, Ser. No. 872,723
Int. Cl.[2] C03C 25/02
U.S. Cl. 65—3 A 6 Claims



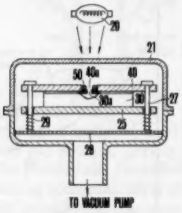
1. A method of manufacturing an optical fibre, comprising:
providing a fused silica tube;
positioning said tube in a microwave cavity;
feeding a carrier gas through said tube;
applying a microwave field to said cavity to produce a plasma in said tube at a position in said cavity and maintain a temperature on the inner wall of said tube of at least 1000° C.;
passing a cooling gas along the outside wall of said tube;
feeding a reactant gas into said tube, and
traversing said tube through said cavity to form a fused layer on the inner wall of the tube.

4,125,390

METHOD OF VACUUM-SEALING VACUUM ARTICLES

Masaru Kawai, and Azusa Minamidani, both of Ise, Japan, assignors to Ise Electronics Corporation, Ise, Japan

Filed Apr. 22, 1977, Ser. No. 790,117
Claims priority, application Japan, Apr. 24, 1976, 51-46786
Int. Cl.[2] C03C 27/00
U.S. Cl. 65—34 4 Claims



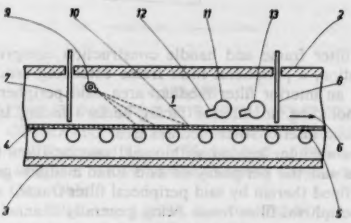
1. A method of vacuum-sealing a vacuum article having an exhaust opening formed therein comprising the steps of:
supporting said vacuum article on a support in an evacuation tank;
clamping said vacuum article to said support with a conductive clamping plate having an opening therein, said clamping plate opening and said exhaust opening being aligned;
placing a ring-shaped sealing member in said clamping plate opening, said sealing member having a lower melting point than that of said vacuum article and a property of not adhering to a surface to be sealed before it is melted;
evacuating said evacuation tank thereby evacuating said vacuum article through said exhaust opening; and
heating and melting said sealing member from a relatively low temperature heat source disposed exteriorly of said evacuation tank so as to seal said exhaust opening thereby obtaining an air-tightly sealed vacuum article.

4,125,391

PROCESS OF FORMING A METAL OR METAL COMPOUND COATING ON A FACE OF A GLASS SUBSTRATE AND APPARATUS SUITABLE FOR USE IN FORMING SUCH COATING

Robert Van Laethem, Loverval, Belgium, assignor to BFG Glassgroup, Paris, France

Filed Mar. 28, 1977, Ser. No. 781,959
Claims priority, application United Kingdom, Apr. 13, 1976, 15065/76
Int. Cl.[2] C03C 17/00
U.S. Cl. 65—60 D 25 Claims



1. A process of forming a uniform metal or metal compound coating on a face of a glass substrate by contacting such face while at elevated temperature with droplets comprising a metal compound which by pyrolysis forms the coating metal or metal compound on said face, the improvement which comprises the steps of discharging at least one stream of said droplets at an inclination to said face so as to impinge on a zone within the face area to be coated, effecting a relative displacement between said stream and substrate in a given direction so that the instantaneous zone of impingement of said stream on said face is progressively displaced along said face area to be coated, said steam being inclined so that it has a velocity component in said given direction and creating suction forces in exhaust ducting whose entrance is located directly downstream from said impingement zone so as to cause gases environmental to said stream to flow continuously in the downstream direction away from said steam and from the vicinity of said impingement zone and directly into said ducting substantially without affecting the paths of the droplets toward said zone.

13. Apparatus suitable for use in forming a uniform metal or metal compound coating on a face of a glass substrate by contacting such face while it is at elevated temperature with droplets comprising a metal compound which by pyrolysis forms said coating metal or metal compound on said face, such apparatus comprising:
means for supporting said substrate;
means for heating such substrate;
means for discharging at least one stream of droplets in a direction which is inclined to a supported substrate so as to impinge on a zone within the substrate face area to be coated;
means for bringing about relative displacement of said droplet discharge means and said substrate in a given direction to cause the instantaneous zone of impingement of the said droplet stream on said face to be progressively displaced along such face area to be coated, the inclination of the stream discharging from said stream discharging means being such as to have a velocity component in said given direction; and
gas exhaust means including exhaust ducting whose entrance is located directly downstream from said impingement zone, said exhaust means being adapted continuously to suck gases environmental to said stream in the downstream direction away from said stream and from the

vicinity of said impingement zone annd directly into said ducting substantially without affecting the paths of the droplets toward said zone.

4,125,392

SEAWEED EXTRACT PRODUCT AND METHODS OF PRODUCING AND UTILIZING SAME

Angelo M. Primo, 35053 Turner, Sterling Heights, Mich. 48077

Continuation-in-part of Ser. No. 550,116, Feb. 14, 1975, Pat. No. 4,016,084, and Ser. No. 550,117, Feb. 14, 1975, abandoned. This application Nov. 26, 1976, Ser. No. 745,171

Int. Cl.[2] A01N *13/00*

U.S. Cl. 71—3 42 Claims

1. A product produced by:

conditioning raw seaweed by mixing said raw seaweed with at least one liquid at least a portion of which is water

wherein said raw seaweed is conditioned by a first conditioning machine and by a second conditioning machine;

in said first conditioning machine said raw seaweed is mixed with a calcium chloride solution and water, and is agitated for predetermined periods of time and the resulting mixture is then fed to said second conditioning machine;

in said second conditioning machine there is added to the mixture a hydrogen chloride solution and water;

the resulting mixture is then fed to the apparatus for performing said digesting where it is admixed with soda ash;

the soda ash and twice-conditioned seaweed mixture is digested by cooking with steam, and stirring the steam-cooked soda ash and twice-conditioned mixture to form a steam-digested mixture; and

the filter cake is removed from the top of the resulting steam-digested mixture and is used as the product per se.

22. A product according to claim 1, wherein:

there is admixed with the product a predetermined quantity of a material selected from the group consisting of weed killers, insecticides, pesticides, nitrogen, phosphorous, potash, and vitamins.

36. A product according to claim 1, wherein:

the product is admixed with a liquid carrier therefor to produce a liquid concentrate thereof for utilization as a fertilizer, soil conditioner, or food or meal for the consumption of animals and/or human beings.

4,125,393

ULV PESTICIDE CONTAINING FERTILIZER

Wilhelm Kohl, Nievenheim; Robert Eibner, Hilden; Hans-Heinrich Nolle, Erkrath; Alfred Schneider, Meerbusch, and Nikolaus-Johann Moldovany, Hilden, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 575,604, May 8, 1975, abandoned. This application Oct. 26, 1976, Ser. No. 735,616

Claims priority, application Fed. Rep. of Germany, May 8, 1974, 2422173

Int. Cl.[2] C05G *3/02*

U.S. Cl. 71—3 6 Claims

1. A leaf fertilizer consisting essentially of an aqueous solution containing nutritively effective amounts of at least one plant nutrient, an effective amount of a ULV pesticide composition 2–12% by weight of at least one hydrophilic and highly electrolyte-resistant anionic or non-ionic emulsifier and 5–20% by weight of at least one neutralization product of at least one amine selected from the group consisting of alkylamines and alkanolamines with at least one amino acid selected from the group consisting of ethylene diamine tetraacetic acid, diethyldiamine pentaacetic acid and N-hydroxylethylenediamine triacetic acid.

4,125,394

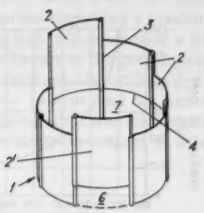
COMPOST BIN WITH SLIDEABLE PANELS

Clifford A. Wilson, Purley, England, assignor to Rotocrop International, Limited, Nassau, The Bahamas

Continuation of Ser. No. 635,804, Nov. 28, 1975, abandoned, which is a division of Ser. No. 526,177, Nov. 22, 1974, Pat. No. 3,951,294, which is a continuation-in-part of Ser. No. 505,278, Sep. 12, 1974, abandoned. This application Apr. 4, 1977, Ser. No. 784,022

Int. Cl.[2] C05F *11/08*

U.S. Cl. 71—9 5 Claims



1. An improved method of providing compost from decomposing vegetable matter in a bin, the improved method comprising the steps of:

providing a bin which is adapted to store a predetermined quantity of vegetable matter therein, and which has a first end, a second end and a longitudinal side wall comprising panels linked together along longitudinal sliding joints so that at least one of the panels may be moved longitudinally with respect to the other panels;

positioning the bin so that the bin is vertically disposed, with its first end being adjacent to the ground and with its second end being spaced from the ground;

intermittently introducing quantities of vegetable matter into the interior of the bin through the second end of the bin, with each such introduced quantity of vegetable matter being less than said predetermined quantity and with said introduced quantities forming generally vertically disposed layers of vegetable matter in the interior of the bin;

storing said introduced quantities of vegetable matter in the bin for a time sufficient to permit decomposition of at least the layer of vegetable matter adjacent to the first end of the bin; and

intermittently and selectively moving a panel longitudinally, in a direction toward the second end of the bin, with respect to the other panels so that an access opening is formed in the side wall of the bin adjacent to the first end of the bin; and

removing the decomposition vegetable matter from within said bin from a position adjacent only to the first end of the bin and only through said access opening formed in said side wall.

5. The method according to claim 1 including the step of ventilating the vegetable matter in the bin while it is being stored in the bin.

4,125,395

NON-PHYTOTOXIC MICRONUTRIENT COMPOSITIONS

John D. Downer, and Dulcie Ragoonanan, both of Pointe-a-Pierre, Trinidad and Tobago, assignors to Texaco Trinidad, Inc., Pointe-a-Pierre, Trinidad and Tobago

Continuation-in-part of Ser. No. 360,505, May 15, 1973, abandoned, and Ser. No. 531,951, Dec. 12, 1974, abandoned. This application Mar. 11, 1977, Ser. No. 776,690

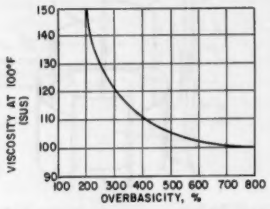
Int. Cl.[2] C05F *11/00*

U.S. Cl. 71—27 10 Claims

1. An overbased composition of matter in micelle form having the empirical formula:

$(RCOO)_2M.xM(OH)_2.yMO$

where M is zinc, copper, iron, manganese or molybdenum; R is a cycloalkyl radical having from 10 to 43 carbon atoms and $(x+y)$ is a number representing the overbasicity ranging from >0 to 19, x being the number of metal naphthenates molecules in the outer layer of said layer, said hydroxide and oxide represented by $M(OH)_2$ and MO, respectively, constituting the excess base in said composition wherein the neutral salt $(RCOO)_2M$ forms an absorbed layer on the hydroxide/oxide moiety represented by $M(OH)_2$ and MO, whereby the possibil-



ity of free naphthenic acids being present in said composition is eliminated.

2. A foliar feeding oil spray composition for supplying trace metals to plants comprising at least one overbased trace metal salt of naphthenic acids as defined in claim 1 and a non-phytotoxic hydrocarbon mineral oil carrier having a minimum gravity API of 27; a viscosity at 100° F. of between 55 and 100 Saybolt Universal Seconds; a boiling point range between about 85° and 775° F. and a minimum unsulphonated residue of 85%; said metal naphthenates being present in said oil at a concentration of between about 0.025 to 8.0 percent weight-/volume.

4,125,396

COMPOSITION AND METHOD FOR DEFOLIATION

Bruce N. Johnson, and Louis P. Cartsunis, both of Oklahoma City, Okla., assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 786,142, Apr. 11, 1977, abandoned. This application Mar. 1, 1978, Ser. No. 882,316

Int. Cl.[2] A01N *9/02, 13/00*

U.S. Cl. 71—70 **9 Claims**

1. A defoliant comprising an aqueous solution containing:

an alkali metal chlorate in an amount of from about 1 to about 30 percent by weight;

an alkali metal carbonate and urea, said carbonate and urea being present in an amount sufficient to provide a ratio of carbonate and urea to chlorate within the range of from about 0.2:1 to 1.2:1 and a ratio of carbonate to urea within the range of from about 1:4 to 4:1; and

a surfactant consisting essentially of the reaction products resulting from (i) sulfonation of alpha olefins having the generalized formula:

$$R - CH = CH_2$$

wherein R represents radicals having the generalized formula:

$$C_nH_{2n+1}$$

wherein n is an integer of from about 10 to about 18 and (ii) hydrolysis of the sulfonation products with an aqueous alkali metal hydroxide to yield a mixture of alkali metal alkenesulfonates and alkali metal hydroxyalkanesulfonates, said surfactant present in an amount of from about 0.5 percent to about 6.0 percent by weight.

4,125,397

O-SULFONYL-ALPHA-HALO-2,6-DIHALOBENZALDOXIMES

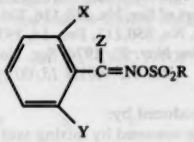
Francis J. Freenor, III, Richmond, and Barbara M. Koerber, Berkeley, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jan. 3, 1977, Ser. No. 756,567

Int. Cl.[2] A01N *9/14*

U.S. Cl. 71—103 **16 Claims**

1. A compound of the formula



wherein R is alkyl of 1 to 6 carbon atoms or chloroalkyl of 1 to 3 carbon atoms and of 1 to 3 chloro groups, Z is chloro or bromo, X is chloro or bromo and Y is chloro or bromo.

4,125,398

N-PHENYL-MALEIC ACID AMIDES FOR REGULATING THE GROWTH AND DEVELOPMENT OF PLANTS

Martin Roth, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

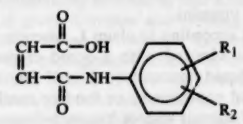
Filed Oct. 28, 1976, Ser. No. 736,655

Claims priority, application Switzerland, Nov. 7, 1975, 14429/75

Int. Cl.[2] A01N *9/24*

U.S. Cl. 71—115 **10 Claims**

1. A method for promoting and facilitating the abscission of fruit which comprises applying to plants bearing the fruit, in an amount sufficient to promote abscission but less than a phytotoxic amount, a compound of the formula



wherein each of R_1 and R_2 is hydrogen, fluorine, chlorine, bromine or C_1–C_4 alkyl, or a salt thereof with an alkali metal, an alkaline earth metal, ammonium or alkylammonium of the formula

$$N^+(R_3)_4$$

in which each R_3 is hydrogen or C_1–C_4 alkyl.

4,125,399

APEX SEALS FOR ROTARY PISTON ENGINES

Fumio Kizu, Hiroshima; Kazuyoshi Hanano, Aki; Kaoru Sotoyama, Saiki, and Masayoshi Matsuo, Aki, all of Japan, assignors to Toyo Kogyo Co., Ltd., Aki, Japan

Filed Aug. 26, 1977, Ser. No. 828,033

Claims priority, application Japan, Aug. 31, 1978, 51-104780

Int. Cl.[2] C22C *38/42, 38/46, 38/54*

U.S. Cl. 75—125 **2 Claims**

1. Apex seal for rotary piston engines which is made of an iron-based material consisting essentially of in weight 2.5 to 4.0% of C, 0.5 to 2.8% of Si, less than 1.0% of Mn, 0.25 to 2.0% of Ni, 0.25 to 2.0% of Mo, 0.25 to 2.0% of Cu, 0.15 to 0.4% of B, 0.15 to 1.5% of Cr, 0.1–0.4% of V and the balance of substantially iron, said material being of chilled structure throughout the apex seal.

4,125,400

AGRICULTURAL SPRAY OIL CONTAINING OXIDATION INHIBITORS

John D. Downer, and Clarence A. L. Phillips, both of Pointe-a-Pierre, Trinidad and Tobago, assignors to Texaco Trinidad, Inc., Pointe-a-Pierre, Trinidad and Tobago

Filed Sep. 21, 1977, Ser. No. 835,280
Int. Cl.[2] A01N *17/08*
U.S. Cl. 71—127 5 Claims

1. A non-phytotoxic oxidation-inhibited horitcultural spray oil composition having a Gravity API of 31–50, a viscosity at 100° F. of 81 to 87 Saybolt Universal Seconds and a boiling range of 85 to 775° F. and a minimum unsulfonated residue of 85% and containing from 0.01 to 8 weight percent of at least one a nonphytotoxic, non-carcinogenic, anti-oxidant compound capable of substantially preventing the oxidation of unsaturated hydrocarbons and of aromatic compounds contained in said oil in the presence of sunlight; said compound being selected from the group consisting of oxidation inhibitors and compounds capable of preventing the homolytic decomposition of peroxides.

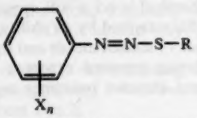
4,125,401

METHOD OF MAKING COPIES OF INFORMATION TRACKS ON CARRIERS

Elisabeth J. Spiertz; Christiaan F. W. Flinsenberg, and Leendert K. H. van Beek, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 3, 1977, Ser. No. 774,192
Claims priority, application Netherlands, Oct. 20, 1976, 7611567
Int. Cl.[2] G03C *5/24, 1/58*
U.S. Cl. 96—49 1 Claim

1. A method of making copies of a carrier of video and/or audio information where the information is present in the form of blocks of variable length separated by areas of variable length all located in a single plane, said blocks of variable length and areas of variable length forming together an information track in the form of a spiral or of concentrical circles, said method comprising exposing to light, through a mask having the desired structure, a light-sensitive material comprising a support having thereon a layer containing as a light-sensitive compound an aromatic diazosulfide of the formula



wherein R is alkyl or aralkyl, X is a substituent and *n* is an integer from 0 to 5 inclusive, treating said exposed light-sentitive material with a water soluble mercury salt or a mixture of a water soluble mercury salt and a silver salt and moisture to form, with the light-reaction product of said light-sensitive compound, a physically developable nuclei metal image of mercury or of silver amalgam on the exposed areas of said light-sensitive material and then developing said light-sensitive material by treatment with a stabilized physical developer containing an aqueous solution of a metal salt, a reducing agent for said metal salt capable of causing said metal salt to deposit free metal on said nuclei metal image and a compound capable of preventing reduction in solution of said salt, the intensity of exposure of said light-sensitive material to light being so chosen that said nuclei image is formed at a distance between 0 and 0.3 μm below the surface of said layer and the time of development is of sufficient duration to cause said free metal deposition on the nuclei image to grow out of said layer.

4,125,402

METHOD OF PROCESSING SILVER DYE BLEACHING MATERIALS AND PREPARATIONS SUITABLE FOR THE DYE AND SILVER BLEACHING

Herbert Mollet, Tentlingen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Aug. 12, 1977, Ser. No. 824,201
Claims priority, application Switzerland, Aug. 19, 1976, 10561/76
Int. Cl.[2] G03C *7/00, 5/32*
U.S. Cl. 96—53 18 Claims

1. A method of processing silver dye bleaching materials which method comprises employing a combined aqueous dye and silver bleaching bath which contains a strong acid in an amount sufficient to impart to the preparation a pH value of not more than 2, a water-soluble iodide, a dye bleaching catalyst, a water-soluble oxidant and an antioxidising agent, wherein the antioxidising agent is an alkali metal, alkaline earth metal or ammonium bisulphite adduct of an aldehyde or ketone.

4,125,403

HEAT DEVELOPABLE LIGHT SENSITIVE MATERIAL

Shinpei Ikenoue; Harumi Katsuyama, and Takao Masuda, all of, Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara

Filed Jun. 27, 1977, Ser. No. 810,656
Claims priority, application Japan, Jun. 25, 1976, 57-75342
Int. Cl.[2] G03C *1/02, 1/28, 1/34*
U.S. Cl. 96—114.1 11 Claims

1. A heat developable light sensitive material which comprises a support having therein or in one or more layers thereon (a) an organic silver salt, (b) a light sensitive silver halide or a component capable of producing a light sensitive silver halide and (c) a reducing agent and additionally containing (d) at least one phthalazinone and (e) at least one compound selected from benzoxazinediones and quinazolinediones; in a molar ratio of the amount of component (e) to that of component (d) less than about 0.2;1 but greater than 0 in at least one layer of said layers containing components (a) to (c), in a specific layer additionally provided on the support other than said layers containing components (a) to (c), or in the support.

4,125,404

PHOTOCHROMIC GLASSES EXHIBITING DICHROISM, BIREFRINGENCE AND COLOR ADAPTATION

Roger J. Araujo, Corning; Nicholas F. Borrelli, Elmira; Jan B. Chodak, Painted Post; George B. Hares, Corning; Gerald S. Meiling, Painted Post, and Thomas P. Seward, III, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Nov. 5, 1976, Ser. No. 739,122
Int. Cl.[2] C03C *3/26, 3/08, 3/30*
U.S. Cl. 106—54 15 Claims

1. A silver halide-containing photochromic glass article exhibiting dichroism and birefringence in the darkened state, wherein the particles comprising the silver halide photochromic phase are randomly oriented.

6. A process for producing a silver halide-containing photochromic glass article exhibiting dichroism and birefringence in the darkened state which comprises the step of irradiating a glass containing a silver halide photochromic phase with linearly polarized optical bleaching light while said glass is in a darkened state.

4,125,405

COLORED, DICHROIC, BIREFRINGENT GLASS ARTICLES PRODUCED BY OPTICAL ALTERATION OF ADDITIVELY-COLORED GLASSES CONTAINING SILVER AND SILVER HALIDES

Roger J. Araujo, Corning; Nicholas F. Borrelli, Elmira; Jan B. Chodak, Painted Post; George B. Hares, Corning; Gerald S. Meiling, Painted Post, and Thomas P. Seward, III, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Nov. 5, 1976, Ser. No. 739,205

Int. Cl.[2] C03C *3/10, 3/08, 3/30*

U.S. Cl. 106—54 16 Claims

1. A method for producing a colored, dichroic birefringent glass article which comprises the steps of selecting an additively colored silver-silver halide containing glass article comprising metallic silver and silver halide phases and irradiating at least a selected region of the selected glass article with polarized light.

10. A dichroic and birefringent additively colored silver-silver halide containing glass article comprising metallic silver and silver halide phases, wherein the particles comprising the silver halide phase are not preferentially oriented.

4,125,406

ALUMINA-CHROMIA-METAL (IV) OXIDE REFRACTORY FIBERS HAVING A MICROCRYSTALLINE PHASE

Harold G. Sowman, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 376,628, Jul. 5, 1973, abandoned. This application Sep. 3, 1974, Ser. No. 502,773

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976.

Int. Cl.[2] C04B *35/10, 35/12, 35/18*

U.S. Cl. 106—57 14 Claims

1. A shaped, fired, transparent smooth refractory fiber having at least one microcrystalline phase, the fiber comprising a composotion of 10–75% Al_2O_3, 1–30% Cr_2O_3 and 10–75% RO_2 wherein R is selected from silicon, titanium, zirconium or tin wherein the fibers having more than 60% Al_2O_3 have a specific surface area of less than 30 m^2/g.

4,125,407

REFRACTORIES WHICH HAVE DENSE-STRUCTURE AS WELL AS SPALLING RESISTANCE AND METHOD FOR FABRICATING SAME

Haruyuki Ueno, Kitakyushu, Japan, assignor to Kurosaki Refractories Co., Ltd., Fukuoka, Japan

Filed Feb. 10, 1977, Ser. No. 767,258

Claims priority, application Japan, Feb. 17, 1976, 51-16647

Int. Cl.[2] C04B *35/48*

U.S. Cl. 106—57 8 Claims

1. Dense refractories having a heterogeneous structure and resistance to spalling, said heterogenous structure comprising a major high density area of coarse and intermediate grains of secondary particulate and minor low density areas of fine grains and fine powders of secondary particulate distributed in a zigzag random way at the boundaries between said coarse and intermediate grains, said secondary particulates comprising agglomerates of primary refractory material, said primary refractory material from which said agglomerate of secondary particles are formed being raw refractory material of fine and/or ultra-fine particles having a particle size of under 74μ, said agglomerates of secondary particulates being separated into at least two groups of particles containing different size ranges in which each group has a different mean linear shrinkage coefficient, the difference in mean linear shrinkage coefficient between said two groups being less than 4%, said two groups being combined into a batch mixture comprising more than 60% by weight of particles of agglomerates of secondary particulates larger than 0.5 mm and less than 40% by weight of particles of agglomerates of secondary particulate smaller than 0.5 mm in size, said mixture being molded and sintered into said dense refractory.

4,125,408

LOW THERMAL EXPANSION CERAMIC COMPOSITION

Paul S. Pieper, Box 1282, Wrangell, Ak. 99929

Filed Oct. 28, 1976, Ser. No. 736,561

Int. Cl.[2] C04B *35/04*

U.S. Cl. 106—62 3 Claims

1. A composition of matter consisting essentially of from 20% to 75% by weight of a hydrothermal high magnesium plastic clay containing about 9–20% MgO intimately mixed with a conventional source of Al_2O_3 and SiO_2 and 5% to 20% of crystalline tremolite, at least some being in a ground lath-like form, said constituents supplied in amounts to approximate the stoichiometric proportions of a cordierite-like ceramic, the CaO content of said tremolite contributing diadochically for part of the MgO in said ceramic, said composition having the capability of being fired at below 1300° C. to produce said cordierite-like ceramic of low thermal expansion characteristics.

4,125,409

HIGH ALUMINA-CHROMIA PLASTIC REFRACTORY MIX

James R. Friedrichs, Lansdale; Edward A. Snajdr, Exton, and Bela Klaudinyi, King of Prussia, all of Pa., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 21, 1977, Ser. No. 862,873

Int. Cl.[2] C04B *35/10, 35/12*

U.S. Cl. 106—66 13 Claims

1. In a high alumina-chromia plastic refractory mix of the type having a general aggregate to matrix ratio of about 2:1, the combination wherein the predominant aggregate component is fused alumina of high purity well suited for use in a plastic refractory mix and the matrix is comprised predominantly of materials having a high specific surface area of at least about 0.1 sq. m./g., the combined alumina-chromia content being in excess of about 80% by weight, the chromia being within the matrix and in an amount sufficient to provide a trigonal phase solid solution upon firing, said mix having a minimal magnesium oxide, iron oxide and alkali metal oxide content providing improved shelf life and plasticity and suppression of a spinel phase formation upon firing, said mix providing a dual bonding system comprising an initial chemical bond and the development of a ceramic bond at a temperature level where the chemical bond is still operative, the resultant refractory being characterized by an ability to withstand corrosive-erosive attack of molten metals and their acid, semibasic and basic slags during repeated exposure thereto, excellent volume stability and abrasive resistance and a low apparent porosity.

4,125,410

WATER-REDUCING ADMIXTURE

Tadao Natsuume, Yokosuka, Japan, assignor to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1976, Ser. No. 717,380

Claims priority, application Japan, Aug. 27, 1975, 50-103843; Sep. 25, 1975, 50-115842

Int. Cl.[2] C04B *13/20*

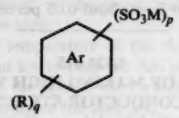
U.S. Cl. 106—90 11 Claims

1. A water-reducing admixture for use in preparing a hydraulic composition comprising

I. 95 to 50% by weight of a water-soluble sulfonate and

II. 5 to 50% by weight of a water-soluble copolymer, said water-soluble sulfonate (I) being selected from the group consisting of

a. a water-soluble salt of a sulfonated aromatic hydrocarbon represented by the following structure



wherein

is an aromatic ring selected from the group consisting of the benzene ring and a condensed ring having 2–12 rings,

M is selected from the group consisting of an alkali metal atom, an alkaline earth metal atom, ammonium ion and a lower amine,

R is selected from the group consisting of hydrogen atom, —NH_2, —OH, —COOH and an alkyl group having 1–2 carbon atoms,

p is an integer from 1 to 2,

q is an integer from 1 to 2,

b. a water-soluble sulfonate having a structural unit represented by the following formula

wherein

is an aromatic ring selected from the group consisting of the benzene ring and a condensed ring having 2–12 rings,

M is selected from the group consisting of an alkali metal atom, an alkaline earth metal atom, ammonium ion and a lower amine,

R is selected from the group consisting of hydrogen atom, —NH_2, —OH, —COOH and an alkyl group having 1–2 carbon atoms,

R' is selected from the group consisting of hydrogen atom and an alkyl group having 1–4 carbon atoms,

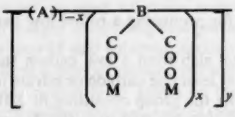
q is an integer from 1 to 2,

m and *n* are each an integer, and *m* plus *n* provides a molecular weight of 1,500–10,000; and

c. a water-soluble salt of sulfonated melamine resin selected from the group consisting of

1 melamine-formaldehyde polycondensates, and

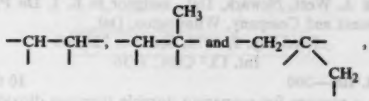
2 melamine-phenol-formaldehyde polycondensates, said water-soluble copolymer (II) being a water-soluble olefin-ethylenically unsaturated dicarboxylic acid salt copolymer having a structural unit represented by the following formula



wherein

A is an olefin unit having 4–6 carbon atoms,

B is selected from the group consisting of



M is selected from the group consisting of an alkali metal atom, an alkaline earth metal atom, ammonium group and a lower amine,

x is from 0.4 to 0.6, and

y is an integer from 2 to 300.

4,125,411

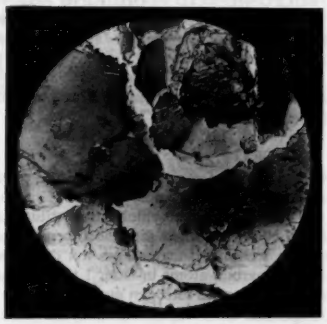
KAOLIN PRODUCT

Sanford C. Lyons, Bennington, Vt., assignor to Yara Engineering Corporation, Elizabeth, N.J.

Continuation-in-part of Ser. No. 764,395, Sep. 30, 1958, abandoned. This application Feb. 14, 1966, Ser. No. 527,151

Int. Cl.[2] **C09C** *1/28, 1/42*

U.S. Cl. 106—291 **1 Claim**



1. A new delaminated clay product produced by delamination of a domestic sedimentary kaolin clay fraction containing substantial amounts of aggregates or more than 2 microns in size, said clay product having a distinct blue-white color comparable with that of improved English clays, said product being substantially free of undelaminated aggregates and booklets and being composed substantially of individual platelets, and containing a sufficient amount of platelets of more than 2 microns in size so as to predominate on a weight basis, a significant proportion of the platelets in excess of 2 microns in size of said product having a ratio of diameter to thickness as determined by the electron micrograph which is in excess of 6 and in which the ratio of diameter to thickness increases as the diameter of the platelets increase, and giving a coated paper with an improved uncalendered gloss at least several points higher on the Bausch and Lomb gloss meter than the uncalendered gloss of conventional domestic coating clays of comparable particle size distribution, said clay product having an adhesive demand no greater than that of conventional domestic coating clays of comparable size distribution, and said product on calcination giving a calcined product having a materially increased G. E. brightness and a materially lower abrasion index than conventional calcined clays.

4,125,412
PROCESS FOR THE PRODUCTION OF DURABLE TITANIUM DIOXIDE PIGMENT

William A. West, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 9, 1976, Ser. No. 721,869
Int. Cl.[2] C09C 1/36
U.S. Cl. 106—300 10 Claims

1. In a process for preparing durable titanium dioxide pigment by depositing in a slurry of TiO_2 a dense silica coating upon said TiO_2 followed by precipitating alumina into said slurry, the improvement which comprises:

A. maintaining the TiO_2 slurry at a temperature of from 80° C. to 100° C. during the silica deposition,

B. adjusting the slurry to a pH of from 9 to 10.5,

C. rapidly adding sufficient sodium silicate to provide from 1.5 to 15% silica, based upon the TiO_2, as a dense, amorphous, substantially continuous coating upon the TiO_2,

D. adjusting the pH of the slurry from 9 to 10.5 and maintaining said pH at a temperature of from 80° C. to 100° C. for from 15 to 60 minutes,

E. adjusting the slurry to a pH of about 8,

F. rapidly adding sodium aluminate and acid simultaneously to the slurry while maintaining the pH of the slurry from 7 to 9, and

G. filtering, washing and drying the treated TiO_2.

4,125,413
DISPERSION OF POLYCYCLIC VAT-DYE PIGMENT WITH N,N'-DISUBSTITUTED DIAMINOSTILBENE SULFONIC ACID FLUIDIZING AGENT

Peter K. Davies; James F. Stansfield, and Arthur Topham, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed May 9, 1977, Ser. No. 795,302
Claims priority, application United Kingdom, Jun. 7, 1976, 23431/76; Sep. 21, 1976, 39093/76
Int. Cl.[2] C08K 5/34
U.S. Cl. 106—308 Q 10 Claims

1. A dispersion of a polycyclic vat-dye pigment in an organic liquid containing a polymeric or resinous dispersion agent and a fluidising agent which is a substituted ammonium salt of a N,N'-disubstituted diaminostilbene sulphonic acid wherein the substituted ammonium ion contains a total of from 2 to 80 carbon atoms in from 1 to 4 organic radicals attached to the central nitrogen atom.

10. A dispersion of flavanthrone in xylene containing dissolved therein

(i) a copolymer of styrene ethylhexylacrylate, hydroxyisopropylmethacrylate, methacrylamide and glycidylmethacrylate in the proportions 26:40:25:5:4 by weight esterified with p-aminobenzoic acid, and

(ii) the cetyl trimethylammonium salt of 4,4'-bis-(4-anilino-6-β-hydroxyethylamino-s-triazin-2-ylamino)stilbene-2,2'-disulphonic acid.

4,125,414
ORGANIC PHOTOVOLTAIC ELEMENTS

Ching W. Tang, Rochester; Alfred P. Marchetti, Penfield, and Ralph H. Young, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 821,117, Aug. 2, 1977, abandoned. This application Mar. 13, 1978, Ser. No. 885,926
Int. Cl.[2] H01L 31/04
U.S. Cl. 136—89 NB 11 Claims

1. A photovoltaic element, comprising:

a layer of a photoconductive composition having opposed surfaces, said composition comprising an electrically insulating binder, a pyrylium-type dye salt and an organic photoconductor;

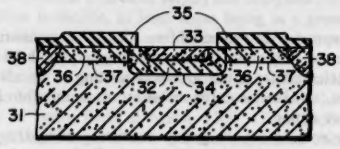
and an electrical conductor adjacent each of said layer surfaces;

said element having a conversion efficiency when exposed to sunlight of at least about 0.05 percent.

4,125,415
METHOD OF MAKING HIGH VOLTAGE SEMICONDUCTOR STRUCTURE

Lowell E. Clark, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 642,940, Dec. 22, 1975, abandoned. This application May 9, 1977, Ser. No. 795,257
Int. Cl.[2] H01L 21/22, 7/54, 21/265
U.S. Cl. 148—1.5 4 Claims



1. A method for forming a high voltage semiconductor device, comprising:

providing a high resistivity substrate of one conductivity type and having first and second major surfaces;

forming a first region of a second opposite conductivity type extending into said substrate from a portion of said first major surface;

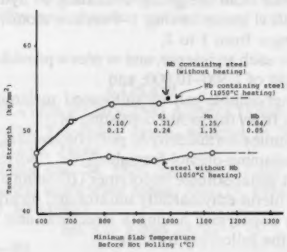
forming a first region of said one conductivity type wholly within said first region and extending from said first major surface;

forming a second region of said second conductivity type with a total doping less than 10^{12} impurity atoms per square centimeter surrounding and abutting said first region of second conductivity type and extending further into said substrate from said first surface than said first region of said one conductivity type.

4,125,416
METHOD FOR PRODUCING STEEL STRIP OR STEEL SHEET CONTAINING CARBIDE AND NITRIDE FORMING ELEMENTS

Hiroshi Katoh; Yasumitsu Onoe, both of Kitakyushu; Koichi Kawamura, and Osamu Akisue, both of Himeji, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 31, 1977, Ser. No. 829,461
Int. Cl.[2] C21D 1/02, 7/13
U.S. Cl. 148—12 F 7 Claims



1. A method for producing a rolled low carbon steel comprising:

forming a steel slab from a low carbon steel composition containing at least one carbide or nitride forming element selected from the group consisting of 0.015 to 0.10% Sol Al, 0.01 to 0.10% Nb, 0.01 to 0.10% Ti, and 0.01 to 0.15% V, by a forming process in which the finished slab is at a

temperature above the Ar_3 point of the steel and in which the said element is dissolved and dispersed evenly throughout the slab;

maintaining the temperature of the thus-formed slab at a temperature no lower than the Ar_3 point of the low carbon steel from the time of the formation of the slab until the start of rolling of the slab; and

directly carrying out hot rolling of the slab at a temperature above the Ar_3 point of the low carbon steel.

4,125,417

METHOD OF SALVAGING AND RESTORING USEFUL PROPERTIES TO USED AND RETIRED METAL ARTICLES

Kenneth C. Antony, Kokomo, Ind., assignor to Cabot Corporation, Kokomo, Ind.

Continuation-in-part of Ser. No. 587,041, Jun. 15, 1975, abandoned. This application Oct. 14, 1976, Ser. No. 732,486

Int. Cl.[2] C21D *1/78*

U.S. Cl. 148—131 **7 Claims**

Relative densities of microdefects in as-cast, over-temperatured and HIP-salvaged blades at 50X

1. A method of salvaging parts to restore the mechanical properties to substantially their original values of hard brittle cast alloys which have been subjected to high temperature stressing in use sufficient to cause creep therein, but not measurable strain and degrade at least some of their mechanical properties, which parts have passed their normal service life and been removed from service comprising hot isostatically pressing those parts at a temperature above that high temperature at which creep occurred, but below the temperature at which incipient melting of the metal commences, for a time sufficient to reverse that creep and improve one or more of those degraded mechanical properties and thereafter heat treating said parts to restore the mechanical properties to their original values so that said parts may be returned to service.

4,125,418

UTILIZATION OF A SUBSTRATE ALIGNMENT MARKER IN EPITAXIAL DEPOSITION PROCESSES

David J. Vinton, Burgess Hill, England, assignor to U.S. Philips Corporation, New York, N.Y.

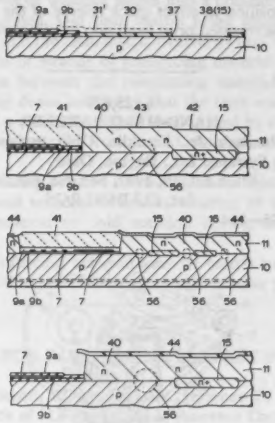
Filed Sep. 23, 1976, Ser. No. 725,775

Claims priority, application United Kingdom, Oct. 6, 1975, 40776/75

Int. Cl.[2] H01L *21/20, 21/66*

U.S. Cl. 148—175 **7 Claims**

1. A method of manufacturing a semiconductor device in which a processing step is effected at an area of the surface of a semiconductor layer portion provided on a substrate surface, the location of said area being defined relative to a reference marker, said method including (a) providing said reference marker on part of said substrate surface, (b) depositing semiconductor material on said substrate surface and on said marker to form a layer comprising one portion which grows epitaxially on a part of said substrate surface not covered by said marker to form a monocrystalline portion of the layer and another portion of which layer grows on the surface of said marker as polycrystalline material, and (c) removing said polycrystalline portion over said marker using an etchant which attacks the polycrystalline material of the layer faster than the monocrystalline material, to re-expose said marker for use with



said processing step at the surface of the remaining semiconductor layer portion.

4,125,419

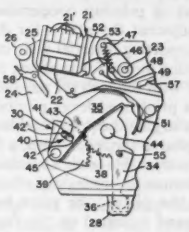
HAND-HELD LABELER AND LABELING METHOD

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Jul. 18, 1977, Ser. No. 816,821

Int. Cl.[2] B41M *1/00*

U.S. Cl. 156—277 **23 Claims**



1. Hand-held apparatus for printing and applying pressure sensitive labels releasably carried on a web of supporting material, comprising: a frame having a handle, an actuator disposed at the handle and movable between an initial position and an actuated position, a platen, a print head, means mounting the print head on the frame for movement into and out of printing cooperation with the platen, means disposed adjacent the platen for delaminating printed labels from the supporting material web, means disposed adjacent the delaminating means for applying printed labels, a feed wheel engageable with the web for advancing the web, spring means for urging the print head into cooperation with the platen, and a drive mechanism for driving the print head away from the platen against the urging action of the spring means and for thereafter driving the feed wheel to advance the just printed label into label applying relationship with respect to the applying means, the drive mechanism including a lever driven in response to movement of the actuator and means for providing independent movement of the lever with respect to the actuator, the print head having a cam cooperable with the lever, the lever being movable between a first position at which the lever acts on the cam to hold the print head out of cooperation with the platen and

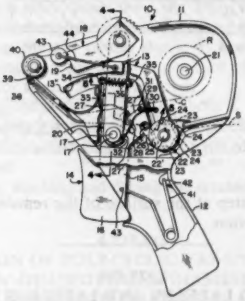
a second position in which the lever is out of holding cooperation with the cam, the spring means being effective to move the cam to drive the lever quickly to the second position when the actuator has been moved to between the initial position and the actuated position to effect quick release of the print head and to move the released print head into printing cooperation with the platen.

4,125,420

HAND-HELD LABELER

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Jul. 18, 1977, Ser. No. 816,846
Int. Cl.[2] B65C *9/26*
U.S. Cl. 156—384 **9 Claims**



1. Hand-held apparatus for printing and applying pressure sensitive labels releasably carried on a web of supporting material, comprising: a frame having a handle, an actuator disposed at the handle and movable between an initial position and an actuated position, a platen, a print head mounted for movement into and out of printing cooperation with the platen, means disposed adjacent the platen for delaminating printed labels from the supporting material web, means disposed adjacent the delaminating means for applying printed labels, a feed wheel engageable with the web for advancing the web, a stop on the actuator, a print head lever pivotally mounted on the frame, a spring for urging the print head lever against the stop, ratchet teeth coupled to the feed wheel, a first pawl carried by the actuator and cooperable with a ratchet tooth to drive the feed wheel to advance the web only after the print head has cooperated with the platen, the print head lever having a tooth, a second pawl mounted on the frame and engageable with the lever tooth after the actuator has moved from the initial position through an increment toward the actuated position, the second pawl being effective to prevent rotation of the lever as the actuator is moved through an additional increment toward the actuated position, and means carried by the actuator for releasing the second pawl from the lever tooth when the actuator has moved through the additional increment to enable the spring to drive the print head into printing cooperation with the platen.

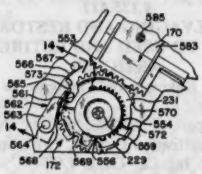
4,125,421

HAND-HELD LABELER

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Jul. 18, 1977, Ser. No. 817,086
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—384 **17 Claims**

1. Hand-held apparatus for printing and applying pressure sensitive labels releasably carried on a web of supporting material, comprising: a frame having a handle, an actuator disposed at the handle and movable between an initial position and an actuated position, a platen, a print head, means mounting the print head on the frame for movement into and out of printing cooperation with the platen, means disposed adjacent the platen for delaminating printed labels from the supporting material web, means disposed adjacent the delaminating means for applying printed labels, a feed wheel engageable with the web for advancing the web, means including a drive mechanism for driving the print head into cooperation from the platen and for thereafter driving the feed wheel to advance the just printed label into label applying relationship with respect to the applying means, the drive mechanism including a first gear section movable in response to movement of the actuator, a second gear section meshing with the first gear section, a third



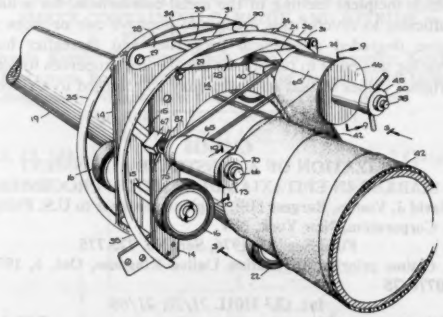
gear coupled to the print head, spring means for urging the third gear section into an initial position relative to the second gear section, means for holding the third gear section in the initial position until the actuator has moved to between its initial position and the actuated position, the second gear section being movable relative to the third gear section against the action of the spring means as the actuator moves away from its initial position, and means for releasing the third gear section when the second gear section has moved through a selected distance to enable the spring means to drive the print head into printing cooperation with the platen.

4,125,422

PIPE WRAPPING MACHINE

Linden Stuart, Jr., Chester, N.J., and Harry R. Davis, Lost Creek, W. Va., assignors to Stuart Steel Protection Corporation, South Bound Brook, N.J.

Filed Sep. 20, 1977, Ser. No. 834,999
Int. Cl.[2] B29H *17/00*
U.S. Cl. 156—394 **10 Claims**



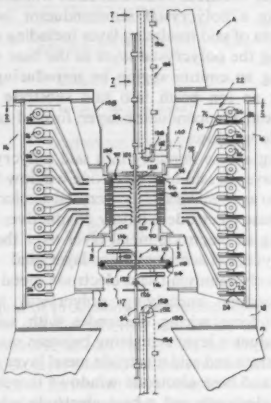
1. In a portable pipe wrapping machine for wrapping a pipe manually which comprises a pipe enveloping frame having a pipe receiving mouth, locking means mounted on said frame for disposition across said pipe receiving mouth to retain a pipe therein, and means mounted on said frame for rotatably supporting said frame concentrically on a pipe, the improvement which comprises in combination roll carrier means adapted to receive thereon and support a roll of wrapping material preformed with a separator sheet that is strippable therefrom and that in said roll separates adjoining plies of said wrapping material from each other, means secured to said frame for rotatably mounting said roll carrier means with a roll of wrapping material carried thereby in position for feeding wrapping

material from said roll onto said pipe during rotation of said frame about said pipe, adjustable friction brake means interposed between said frame and said roll carrier means for adjustably controlling resistance to rotation of said roll carrier means so as to thereby adjustably impose a predetermined tensile pull on wrapping material as it is removed from said roll and wrapped about said pipe responsive to said frame being rotated about said pipe, and a sheet receiving assembly mounted on said frame comprising a windup spool, means for rotatably mounting said windup spool in position for receiving to be wound thereon separator sheet stripped from said wrapping material as it is unwound from said roll carried by said roll carrier means and driving means comprising adjustable friction clutch means for rotating said spool responsive to rotation of said roll carrier means so as to maintain said protector sheet under a predetermined pull-tension as it is stripped from said wrapping material and wound up on said spool.

4,125,423
REINFORCED PLASTIC TAPERED ROD PRODUCTS AND THE METHOD AND APPARATUS FOR PRODUCING SAME

William B. Goldsworthy, Palos Verdes Estates, Calif., assignor to Goldsworthy Engineering, Inc., Torrance, Calif.

Filed May 17, 1976, Ser. No. 687,148
Int. Cl.[2] B65H *81/00*
U.S. Cl. 156—428 **23 Claims**



1. An apparatus for producing a reinforced plastic tubular product having a tapered shape, said apparatus comprising:

(a) frame means,

(b) a plurality of successive winding stages operatively mounted on said frame means,

(c) a plurality of sources of filament containing reinforcing material associated with each of said winding stages and capable of issuing strands of the reinforcing material therefrom, each of said sources being spaced apart from each other in at least a somewhat vertical direction,

(d) means for moving a mandrel having a tapered shape equivalent to that of the product to be produced past said successive winding stages in at least a somewhat vertical direction and winding the issued strands of reinforcing material on said mandrel during movement thereof, said strands of reinforcing material being applied to the mandrel from the plurality of sources at each such winding stage forming a conically shaped section of reinforcing material directed rearwardly with respect to the movement of the mandrel, the density of the strands of reinforcing material decreasing in proportion to the distance radially outwardly from the mandrel, said strands forming a conically shaped section around said mandrel which is relatively dense and relatively resin matrix impervious but which becomes pervious to resin matrix through opened portions between the strands at distances radially outwardly therefrom,

(e) means for applying a liquid resin matrix in relation to one of said successive winding stages into a conically shaped section as formed, said resin matrix being applied in an amount said that the resin matrix overflows said relatively dense portion of strands of reinforcing material through opened areas between the reinforcing material beyond said relatively dense portion so that the resin matrix may flow toward a conically shaped area formed by strands of reinforcement material from a next succeeding winding stage, and

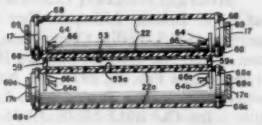
(f) means for causing relative rotation between said winding stages and said mandrel to enable winding of said reinforcement material on said mandrel during movement thereof,

whereby said reinforcing material may be matrix cured and removed from said mandrel to produce said tubular product.

4,125,424
APPARATUS FOR FABRICATING BATTERY PLATE SLEEVES

Camillo M. Vecchiotti, Ridgewood, and Raymond P. Meenen, Hawthorne, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Filed May 4, 1977, Ser. No. 793,482
Int. Cl.[2] B30B *15/34*; B32B *31/04*
U.S. Cl. 156—550 **26 Claims**



1. An apparatus for the fabrication of battery separator sleeves, comprising:

a supply source of a microporous plastic sheet material;

a supply source of a plastic sealing strip, said plastic sealing strip having a transverse cross-sectional shape characterized by a major dimension greater than a minor dimension;

means for positioning said sealing strip along one lateral edge of said sheet material with the minor dimension of said transverse cross-sectional shape being parallel to the surface of said sheet and the major dimension of said cross-sectional shape extending perpendicular to said sheet;

means for dispensing a bonding material into the interface between said sealing strip and said sheet material; and

means for applying pressure to the separator sleeve defined by the assembly of said sheet material and said sealing strip to initiate bonding of said assembly by the bonding material and to accurately locate said sealing strip along said lateral edge of said sheet material.

20. An apparatus for the fabrication of battery separator sleeves, comprising:

a first supply source of a first microporous plastic sheet material;

first and second supply sources of first and second plastic sealing strips, respectively, said sealing strips having a transverse cross-sectional shape characterized by a major dimension greater than a minor dimension; means for positioning said first sealing strip along one lateral edge of said first sheet material and said second sealing strip along the other lateral edge of said first sheet material with the major dimension of each said sealing strip extending perpendicular to each said lateral edge;

a second supply source of a second microporous plastic sheet material;

second means for positioning said second sheet material in superposed orientation with respect to said first sheet material and for aligning the lateral edges of said second sheet material with said first and second sealing strips;

means for dispensing a bonding material into the interfaces between said first and second sealing strips and said first and second sheet materials;

means located between said positioning means and said second means for substantially immediately applying pressure to the separator sleeve defined by the assembly of said first sheet material and said first and second sealing strips to initiate bonding of said assembly by the bonding material prior to positioning of said second sheet by said second means as aforesaid; second means for applying pressure to said assembly and said second sheet to initiate bonding thereof, said second pressure applying means being located downstream with respect to said second positioning means; and

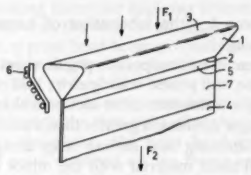
cutter means to cut the bonded separator sleeve assembly into predetermined lengths.

4,125,425

METHOD OF MANUFACTURING FLAT TAPES OF CRYSTALLINE SILICON FROM A SILICON MELT BY DRAWING A SEED CRYSTAL OF SIL.CON FROM THE MELT FLOWING DOWN THE FACES OF A KNIFE SHAPED HEATED ELEMENT

Jean-Jacques L. E. Brissot, Maisons-Alfort (Val de Marne), France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 553,987, Feb. 28, 1975, abandoned.
This application Feb. 28, 1977, Ser. No. 772,349
Claims priority, application France, Mar. 1, 1974, 74 07044
Int. Cl.[2] B01J *17/18, 17/16*
U.S. Cl. 156—617 R **12 Claims**



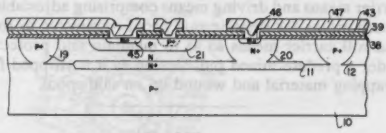
1. A method of manufacturing flat tapes of crystalline silicon, said method comprising contacting a supply of solid silicon with the upper surface of an element heated to the melting point of said silicon, to thereby convert said solid silicon into a molten silicon mass flowing downwardly over the outer surface of said heated element, said element being a cylinder having a horizontal axis, a first surface essentially parallel to said horizontal axis and two additional surfaces extending downwardly from the edges of said first surface and meeting each other at their lower edges to form a rectangular shaped rim, the surface of said element being resistant to the action of said molten silicon mass and at least said two downwardly extending surfaces and said rim being formed of a material wettable by said molten silicon mass, contacting said downwardly flowing molten silicon mass with a silicon crystal seed positioned at a small distance below the lower edge of said rectangular shaped rim to thereby wet the upper surface of said crystal seed with said downwardly flowing molten silicon mass and drawing said thus wetted seed crystal downwardly from said element to thereby cause said molten silicon mass to solidify and grow a downwardly extending flat crystalline silicon tape.

4,125,426

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

Katsuyuki Inayoshi, Yokohama, and Yoshinobu Monma, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 681,406, Apr. 29, 1976, abandoned.
This application Aug. 18, 1977, Ser. No. 825,763
Claims priority, application Japan, Apr. 29, 1975, 50-51521
Int. Cl.[2] H01L *21/312*
U.S. Cl. 156—656 **10 Claims**



1. A method of manufacturing a semiconductor device on a substrate surface comprising the steps of:

(a) forming a base region and an insulating layer on said semiconductor substrate surface, said insulating layer covering said semiconductor substrate surface;

(b) forming an emitter electrode window and a base electrode window in said insulating layer to expose said semiconductor substrate surface in each window;

(c) forming a polycrystal semiconductor layer over the entire area of said insulating layer including said windows;

(d) masking the polycrystal layer in the base window;

(e) forming an emitter region by introducing an impurity utilizing an ion beam into said substrate through said polycrystal semiconductor layer formed in said emitter electrode window;

(f) diffusing a base impurity into said polycrystal semiconductor layer in said base electrode window from said base region so as to make said polycrystal semiconductor layer in said base electrode window conductive;

(g) forming an electrode metal layer over the entire are of said polycrystal semiconductor layer; and

(h) selectively removing said electrode metal layer and the corresponding underlying polycrystal semiconductor layer to form wiring electrodes with said polycrystal semiconductor layer remaining between said semiconductor substrate and said electrode metal layer at each of said emitter and base electrode windows thereby forming an emitter electrode and a base electrode which are ohmically connected to said emitter region and said base region respectively.

5. A method of manufacturing a semiconductor device on a silicon substrate comprising the steps of:

forming a base region in said silicon substrate;

forming a silicon dioxide film over the entire surface of said silicon substrate;

forming an emitter diffusion window and base electrode window on said silicon dioxide film covering said silicon substrate surface to expose said silicon substrate surface base region in said windows;

forming a polysilicon layer over the entire surface of said silicon dioxide film and each of said formed windows;

forming a diffusion source layer including an impurity over the entire surface of said polycrystal silicon layer, except for at least the base electrode window;

forming an emitter region within the base region by diffusing said impurity into the silicon substrate at said emitter diffusion window through the polycrystal silicon layer;

simultaneously diffusing a base impurity into said polycrystal semiconductor layer in said base electrode window from said base region so as to make said polycrystal semiconductor layer in said base electrode window conductive;

removing said diffusion source layer;

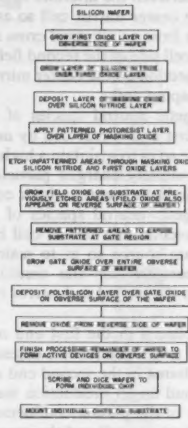
coating an electrode metal layer over the entire surface of said polycrystal silicon layer;

selectively removing said electrode metal layer and the corresponding underlying polycrystal silicon layer to form wiring electrodes having said polycrystal silicon layer remaining between said silicon substrate and said electrode metal layer at each of said emitter and base electrode windows thereby forming an emitter electrode and a base electrode which are ohmically connected to said emitter region and said base region respectively.

4,125,427
METHOD OF PROCESSING A SEMICONDUCTOR

Peter C. Chen; John K. Stewart, Jr., both of West Carrollton, Ohio, and Tuh-Kai Koo, Escondido, Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 27, 1976, Ser. No. 718,291
Int. Cl.[2] H01L *21/312*
U.S. Cl. 156—657 **4 Claims**


SILICON WAFER
STEP A
GROW FIRST OXIDE LAYER ON OBVERSE SIDE OF WAFER
STEP B
GROW LAYER OF SILICON NITRIDE OVER FIRST OXIDE LAYER
STEP C
DEPOSIT LAYER OF MASKING OXIDE OVER SILICON NITRIDE LAYER
STEP D
APPLY PATTERNED PHOTORESIST LAYER OVER LAYER OF MASKING OXIDE
STEP E
ETCH UNPATTERNED AREAS THROUGH MASKING OXIDE, SILICON NITRIDE AND FIRST OXIDE LAYERS
STEP F
GROW FIELD OXIDE ON SUBSTRATE AT PREVIOUSLY ETCHED AREAS (FIELD OXIDE ALSO APPEARS ON REVERSE SURFACE OF WAFER)
STEP G
REMOVE PATTERNED AREAS TO EXPOSE SUBSTRATE AT GATE REGION
STEP H
GROW GATE OXIDE OVER ENTIRE OBVERSE SURFACE OF WAFER
STEP I
DEPOSIT POLYSILICON LAYER OVER GATE OXIDE ON OBVERSE SURFACE OF THE WAFER
STEP J
REMOVE OXIDE FROM REVERSE SIDE OF WAFER
STEP K
FINISH PROCESSING REMAINDER OF WAFER TO FORM ACTIVE DEVICES ON OBVERSE SURFACE
STEP L
SCRIBE AND DICE WAFER TO FORM INDIVIDUAL CHIP
STEP M
MOUNT INDIVIDUAL CHIPS ON SUBSTRATE
STEP N

1. In a method of processing a semiconductor device on the obverse side of a wafer wherein the device includes an electrode on the obverse side of the wafer, the improved process wherein an oxide layer formed on the reverse side of the wafer is removed prior to formation of the electrode and comprising:

partially forming the device on the obverse side of a semiconductive wafer, including the step of growing a layer of oxide on selected portions of the obverse side of the wafer, the oxide being simultaneously undesirably grown on the reverse side of the wafer;

providing a layer of etch resistant material on the layer of oxide on the obverse side of the wafer, the etch resistant material being suitable for forming a device electrode therefrom;

selectively etching the oxide from the reverse side of the wafer prior to the formation of the electrode; and

forming the layer of etch resistant material into an electrode.

4,125,428
VERTICAL TWIN WIRE PAPER MACHINE

Richard W. Phelps, Fulton, N.Y., assignor to The Black Clawson Company, Middletown, Ohio

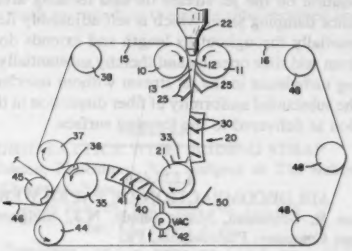
Filed Jun. 27, 1977, Ser. No. 810,054
Int. Cl.[2] D21F *1/00, 1/54*
U.S. Cl. 162—301 **11 Claims**

1. Apparatus for forming a paper sheet between a pair of forming wires and including a pair of breast rolls cooperating to support a pair of generally vertically traveling reaches of said wires in opposed generally horizontally spaced relation defining a mouth of predetermined width, and headbox means for supplying paper making stock to said mouth at a first predetermined solids consistency as a sheet-like jet of a thickness less than the width of said mouth, comprising

(a) guide means cooperating with said wire reaches to establish a wedge zone wherein said reaches converge generally vertically downstream from said mouth to a relative spacing determined by the thickness of the stock therebetween at a second predetermined solids consistency resulting from drainage of liquid through said reaches at a calculated rate,

(b) said guide means being deflector members positioned to engage and support said reaches in said converging relation as liquid extrudes through said reaches while the fibers remaining between said reaches form a paper sheet,

(c) said deflector members being arranged in vertically alternating relation on opposite sides of said wedge zone and in progressively more closely spaced relation with the vertical center line of said wedge zone such that the distance from each deflector member to a plane connecting the closest opposed pair of said deflector members substantially corresponds to the thickness of said reaches plus



the thickness of the stock between said reaches at the vertical level of said deflector member at said calculated drainage rate,

(d) support means cooperating with said wire reaches to define a pressure zone located downstream from the smaller end of said wedge zone and including means defining a convexly curved intermittent surface,

(e) means for guiding said wires from the most downstream of said deflector members into wrapping engagement with said intermittent surface while maintaining both of said wires under tension causing pressure on said sheet and continued extrusion of liquid through said wires in traveling across said surface,

(f) means for directing said wires with said sheet therebetween away from the downstream end of said pressure zone,

(g) means downstream from said pressure zone for effecting separation of one of said wires from said sheet and the other said wire, and

(h) transfer means for removing said sheet from said other wire for delivery to a further processing station.

4,125,429
HEADBOX TURBULENCE GENERATOR AND DAMPING SHEET

Richard E. Hergert, Rockton, Ill., and Charles L. Sanford, Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Filed Mar. 8, 1977, Ser. No. 775,451
Int. Cl.[2] D21F *1/02*
U.S. Cl. 162—123 **17 Claims**

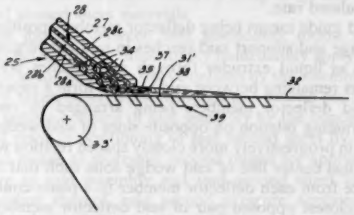
1. A method of papermaking comprising:

issuing a jet stream of fiber suspension from a substantially rigidly defined slice opening leading from a headbox nozzle passage and delivering the stream to a generally upwardly facing forming area on a travelling paper web forming surface;

generating turbulence in the suspension in the nozzle passage

in such close adjacency to the slice opening as to substantially avoid turbulence decay upstream from the slice opening and thereby assuring thorough and substantially uniform dispersion of the fibers in the jet stream;

and after the jet stream has left the slice opening and is carried on said forming area, superimposing in freely lying



relation on the jet stream on said forming area a turbulence damping sheet which is self-adjustably flexible substantially throughout its length and extends downstream from said slice opening and thereby substantially suppressing turbulence in the jet stream without interferring with the substantial uniformity of fiber dispersion in the suspension as delivered to the forming surface.

4,125,430

AIR DECOMPACTION OF PAPER WEBS

Stephen R. Grossman, Maple Shade, N.J., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Apr. 22, 1977, Ser. No. 789,809
Int. Cl.[2] D21F *11/00*
U.S. Cl. 162—207 **11 Claims**

1. A method of forming a high bulk, low density fibrous web comprising the steps of:

(a) forming a fibrous web having a basis weight of about 20 to about 60 pounds per ream and a non-directional breaking length of about 50 to abut 500 meters;

(b) transporting the web between a pair of foraminous restraining members spaced apart at least two times the initial thickness of the web; and

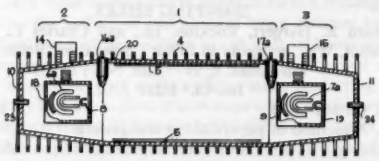
(c) impinging a gaseous medium through the foraminous restraining members onto opposed major surfaces of the web for decompacting the web substantially throughout the entire thickness of the web by a factor of about 2.5.

4,125,431

TANDEM MIRROR PLASMA CONFINEMENT APPARATUS

T. Kenneth Fowler, Walnut Creek, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 16, 1977, Ser. No. 807,081
Int. Cl.[2] G21B *1/00*
U.S. Cl. 176—3 **34 Claims**



33. A method for confining plasma comprising producing a minimum B magnetic field of multi-Tesla strength at an array of current-carrying coils comprising a first end mirror cell;

producing a minimum B magnetic field of multi-Tesla strength at an array of current-carrying coils comprising a second end mirror cell;

positioning a center mirror cell having a solenoid of discrete current-carrying coils between the first end mirror cell and the second end mirror cell so as to enclose continuous magnetic field lines between the first end mirror cell and the second end mirror cell;

producing a magnetic field at the current-carrying coils of the solenoid which is less than the magnetic field strength at the current-carrying coils of the first or second end mirror cell;

positioning a first field shaping coil about the magnetic field lines passing between the interiors of the first end mirror cell and the center mirror cell so as to shape the magnetic field lines from an elliptical cross section on the first end mirror side of the first field shaping coil to a circular cross section on the center mirror cell side of the first field shaping coil;

positioning a second field shaping coil about the magnetic field lines passing between the interiors of the second end mirror cell and the center mirror cell so as to shape the magnetic field lines from an elliptical cross section on the second end mirror cell side of the second field shaping coil to a circular cross section on the center mirror cell side of the second field shaping coil;

introducing an energetic neutral species of plasma to be confined into the first end mirror cell by means of a first neutral beam source so as to maintain a higher density and temperature for positively charged particles in the first end mirror cell than in the center mirror cell;

introducing an energetic neutral species of plasma to be confined into the second end mirror cell by means of a second neutral beam source so as to maintain a higher density and temperature for the resulting positively charged particles in the second end mirror cell than in the center mirror cell;

generating a target plasma in the first end mirror cell for startup with a first target production means;

generating a target plasma in the second end mirror cell for startup with a second target production means;

evacuating the inside of the plasma confinement apparatus;

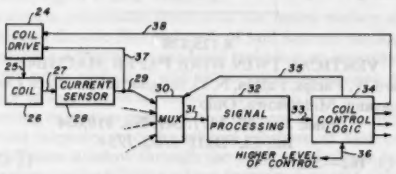
whereby the first end mirror cell and the second end mirror cell plasma each develop a net positive charge, the center mirror cell plasma develops a net negative charge, and the first and second end mirror cell plasmas repel positively charged particles contained in the center mirror cell.

4,125,432

DRIVE MECHANISM NUCLEAR REACTOR CONTROL ROD

James G. Brooks, Jr., Southwick, Mass.; Douglas R. Maure, Newington, and Christoffel H. Meijer, Windsor, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 24, 1977, Ser. No. 762,067
Int. Cl.[2] G21C *7/06, 7/00, 7/08*
U.S. Cl. 176—22 **24 Claims**



1. A method of monitoring the movement of a control-rod-drive latch that is operated by a drive coil, comprising the steps of:

a. sensing the current level in the drive coil; and

b. comparing the waveform in the current level to at least

one waveform that is characteristic of the coil when the latch is not moving, thereby detecting the start of the latch movement when the current waveform deviates from a waveform that is characteristic of the coil when the latch is not moving and detecting the end of latch motion when the current reassumes a waveform that is characterstic of the coil when the latch is not moving.

4,125,433

FUEL ASSEMBLY FOR A NUCLEAR FAST NEUTRON REACTOR

Vladimir G. Iljunin, ulitsa Zvezdnaya, 15, kv. 70; Viktor M. Murogov, ulitsa Lenina, 13/1, kv. 4; Mikhail F. Troyanov, ulitsa Lenina, 36a, kv. 30; Anatoly A. Rineisky, ulitsa Lyashenko, 2, kv. 35, all of Obninsk Kaluzhskoi oblasti, and Anatoly N. Shmelev, Proletarsky prospekt, 77, kv. 96, Moscow, all of U.S.S.R.

Filed Dec. 16, 1976, Ser. No. 751,526
Int. Cl.[2] G21C *3/02*
U.S. Cl. 176—68 **7 Claims**

1. A fuel assembly for a nuclear fast reactor, which comprises:
- a shroud having first and second butts;
- a tail piece connected to said shroud at the first butt and having inlet ports for a coolant;
- a head piece connected to said shroud at the second butt and having outlet ports for said coolant;
- fuel elements located in said shroud and having portions filled with fissionable and raw materials and respective gas plenums which serve as accumulation reservoirs for evolved fission gases; and
- said gas plenums being divided into a central group and a peripheral group, with at least one of said groups being located in said tail piece downstream of said coolant inlet ports before said portions of said fuel elements filled with said fissionable and raw materials; whereby the breeding gain of said reactor is increased and the fuel doubling time is reduced.

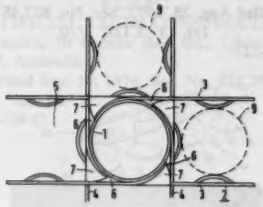
4,125,434

NUCLEAR REACTOR-FUEL ELEMENT

Gustav Frömel; Peter Suchy, both of Erlangen, and Gerhard Ulrych, Tennenlohe, all of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Jan. 19, 1977, Ser. No. 760,357
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1976, 2602124
Int. Cl.[2] G21C *3/02*
U.S. Cl. 176—76 **9 Claims**

1. In a nuclear reactor-fuel element with cylindrical fuel rods and a fuel element skeleton formed of a head and foot member and cylindrical control rod-guide tubes connecting said members, a plurality of mesh-forming spacing holder-grids for the fuel rods fastened to the guide tubes, the control rod-guide tubes being received in respective mesh formed by said spacing



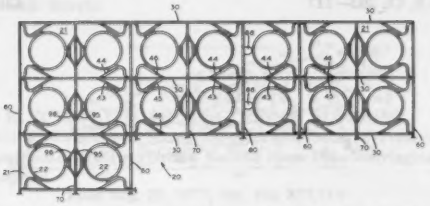
holder-grids, the respective mesh wherein the control rod-guide tubes are received having a given flow cross section surrounding the respective guide tubes, and flow guide means closing at least three-fourths of the flow cross section of the respective mesh surrounding the guide tube received therein.

4,125,435

GRID LATTICE WITH SLIDING STRAP

Felix S. Jabsen, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Feb. 25, 1977, Ser. No. 772,183
Int. Cl.[2] G21C *3/30*
U.S. Cl. 176—78 **14 Claims**



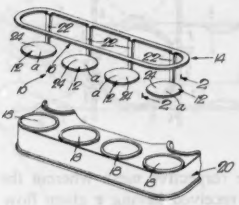
1. In a fuel assembly for a nuclear reactor having a plurality of fuel rods, a spacer for laterally supporting and spacing the rods comprising:
- a plurality of longitudinally spaced pairs of grid plates of a first type having oppositely disposed longitudinal faces with protrusions contoured to engage the surfaces of adjacent fuel rods laterally projecting a portion of each face;
- a plurality of straps having oppositely disposed longitudinal faces with protrusions laterally projecting a portion of each face;
- other types of grid plates;
- the pairs of the first type plates being arrayed in parallel with each other pair and generally perpendicular to and intersecting the other types of grid plates, thereby forming a plurality of cells of substantially open cross section through which the fuel rods longitudinally extend;
- said protrusions of the first type of grid plate and said strap protrusions projecting into each adjacent cell; and
- said straps each traversing the longitudinal space between each pair of the first type of grid plate to enable said straps to be pulled so that said strap protrusions engage the fuel rods in the adjacent cells and thereby cause the rods to be transversely spaced and supported by said strap protrusions and said protrusions of the first type of grid plates.

4,125,436

SLIPS FOR SPECIMEN GROWTH AND MICROSCOPIC EXAMINATION

John Liner, Stratford, Conn., assignor to Linbro Scientific, Inc., Hamden, Conn.

Filed Aug. 25, 1977, Ser. No. 827,457
Int. Cl.[2] C12K 1/10
U.S. Cl. 195—127 **6 Claims**



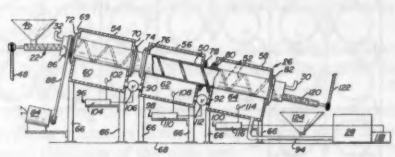
1. A specimen growth and examination plate, comprising a flat transparent plastic slip part with a periphery, and a plastic handle part formed integrally with said slip part and providing a prong with opposite ends and disposed upright with respect to said slip part, a handle at one end of said prong, and a joint connecting the other end of said prong with the periphery of said slip part, with said joint having a constriction for ready snap-off of said slip part from said handle part.

4,125,437

DISTILLATION SYSTEM

Conrad G. Bacon, 2960 Hannah Ave., Norristown, Pa. 19403

Filed Nov. 1, 1976, Ser. No. 737,773
Int. Cl.[2] C10B 1/10
U.S. Cl. 202—117 **7 Claims**



1. A distillation system comprising:

(a) retort means for displacing shale material to be distilled through a plurality of heat zones said retort means including a cylindrical retort having spirally formed grooves within an inner wall of said retort;

(b) means for rotatably displacing said retort means;

(c) a plurality of discrete enclosure means spaced each from the other and surrounding said retort means, each of said enclosure means defining a housing forming a heating chamber defining said heat zones through which said retort means passes;

(d) heating means coupled to one of said enclosure means for producing heated gases to be fluidly displaced consecutively through each of said discrete enclosure means;

(e) means thermally coupling each enclosure means to a next consecutively positioned enclosure means for passing heated gases from one of said enclosure means to a next consecutive enclosure means; and

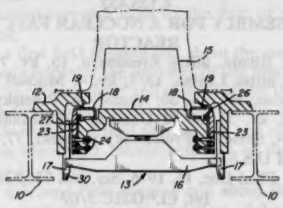
(f) means for maintaining a predetermined temperature in each of said enclosure means including means for the insertion of ambient air into an enclosure means dependent upon said predetermined temperature to be maintained in said enclosure, and including thermocouple control means mounted within each heating chamber for controlling flow of heated gas and said ambient air into said heat chambers for maintenance of said predetermined temperatures.

4,125,438

GUIDING MEANS FOR COKE OVEN DOORS

Calvin E. Kelly, and Thomas E. Nicely, both of Franklin Township, Westmoreland County, Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Sep. 19, 1977, Ser. No. 834,748
Int. Cl.[2] C10B 25/06, 25/16
U.S. Cl. 202—248 **8 Claims**



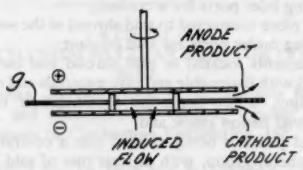
1. In a coke oven door which includes a metal frame, latch bars rotatably mounted on said frame for latching the door in its closed position, and flexible metal sealing members extending around the perimeter of said frame and having forward edges adapted to contact a flat surface for effecting a seal, the combination therewith of improved means for guiding said door, said means comprising a plurality of guide bars affixed to said frame in line with the latch bars when the latch bars are in a position for latching the door in its closed position, said guide bars having forward end portions which taper at their outside faces toward their forward tips, the forward tips of said guide bars being closely adjacent the forward edges of said sealing members to enable said guide bars to contact said flat surface after the sealing members and serve also as stops.

4,125,439

ELECTROCHEMICAL CELLS AND METHODS OF ELECTROLYSIS

Martin Fleischmann, Eastleigh; Robert E. W. Jansson, Hythe, and Rodney J. Marshall, Southampton, all of England, assignors to National Research Development Corporation, London, England

Filed May 31, 1977, Ser. No. 801,993
Int. Cl.[2] C25B 1/02, 9/00
U.S. Cl. 204—1 R **3 Claims**



1. A process of diaphragmless electrolysis, comprising

providing an electrochemical cell having substantially parallel electrodes in the form of discs axially spaced from each other and connected for common rotation about their axis, one of the discs having means defining a central opening,

causing common rotation of the electrodes,

introducing matter to be electrolysed through said central opening,

adjusting the speed of rotation until the profile of velocity of effective radial flow between the discs shows a double-humped distribution, and

applying a potential between the discs.

3. An electrochemical cell having

substantially parallel electrodes in the form of discs axially spaced from each other and connected for common rotation about their axis, one of the discs having means defining a central opening,

rotation means for rotating the electrodes at a speed whereat the profile of velocity of effective radial flow between the discs shows a double-humped distribution,

a container surrounding the electrodes permitting fluid contents to be electrolyzed to be introduced through said central opening,

energizing means for applying a potential between the discs and

annular splitter means arranged at the periphery of the discs, by which anolyte may be separated from catholyte.

4,125,440

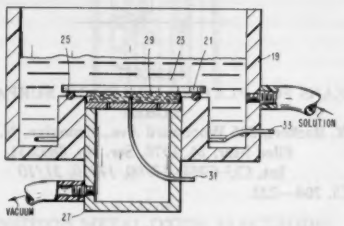
METHOD FOR NON-DESTRUCTIVE TESTING OF SEMICONDUCTOR ARTICLES

Gary Markovits, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 25, 1977, Ser. No. 818,908

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—1 T **6 Claims**



1. A method of locating electrically active damage sites in a monocrystalline semiconductor substrate comprising:

immersing said substrate in a dilute electrolyte solution which is a source of H_3O^+ ions, illuminating the surface of said substrate with light having an intensity of from about 50 to 75 foot candles, and negatively biasing the substrate with respect to the electrolyte solution at a voltage level of from about 50 to 65 volts so as to produce hydrogen gas bubbles at the electrically active damage sites.

4,125,441

ISOLATED BUMP CIRCUITRY ON TAPE UTILIZING ELECTROFORMING

William P. Dugan, Pomona, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Jan. 30, 1978, Ser. No. 873,461

Int. Cl.[2] C25D *1/00, 1/04, 1/20*

U.S. Cl. 204—12 **7 Claims**

1. A process for electroforming a bump circuit and a lead circuit on a tape, said process comprising the steps of:

(a) coating a first metal plate with a photoresist on one surface thereof;

(b) removing the photoresist from those areas where bumps are to be formed;

(c) chemically etching indentations partly through the uncovered metal surface to form a bump circuit;

(d) completely removing the photoresist;

(e) covering the surface of the metal plate again with a succeeding layer of photoresist;

(f) removing the photoresist from those areas where a lead circuit is to be formed and including the previously formed indentations;

(g) chemically etching partly through the uncovered metal to form the lead circuit and to additionally etch the bump circuit;

(h) plating a second metal over the exposed surface of the first metal plate, said second metal being of a type which resists a chemical etch for the first metal; and

(i) chemically removing the first metal plate.

4,125,442

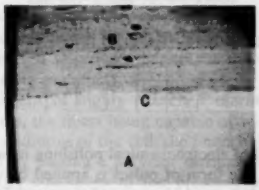
ARTIFICIAL TEETH CONSTRUCTION

Olbert W. Rogers, 70 Gymea Bay Rd., Gymea, New South Wales 2227, Australia

Filed Sep. 10, 1976, Ser. No. 722,291

Int. Cl.[2] A61C *5/08;* C25D *5/34*

U.S. Cl. 204—38 C **7 Claims**



1. A method for use in constructing composite metal-porcelain tooth and/or bone reconstructions, the basis metal being a chromium alloy comprising the steps of pretreating the basis metal by etching, the etching being conducted anodically, followed by cathodic activation depositing a first layer of metal on said basis metal, said first layer of metal being selected from the group consisting of tin, silver, iron, zinc, copper and indium; further depositing on said first metal layer a second metal layer, said second layer of metal being selected from the group consisting of gold alloys and platinum; and bonding porcelain thereto.

4,125,443

ELECTROLYTIC PRODUCTION OF FLUORINE

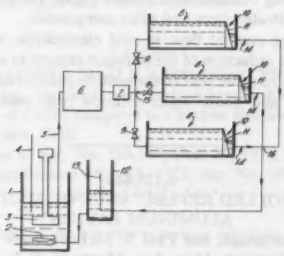
Albert E. Grant, and Stanley Wainwright, both of Preston, England, assignors to British Nuclear Fuels Ltd., Warrington, England

Filed Sep. 29, 1977, Ser. No. 837,711

Claims priority, application United Kingdom, Oct. 19, 1976, 43385/76

Int. Cl.[2] C25B *1/24, 15/08*

U.S. Cl. 204—60 **11 Claims**



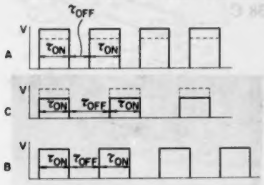
6. A process for the production of fluorine by electrolysis of a fused electrolyte containing potassium fluoride and hydrogen fluoride in which the fused electrolyte is circulated from a tank to one or more electrolytic cells through a heat exchanger to remove heat from the circulating electrolyte so that the temperature of the electrolyte is controlled such that the temperature of the electrolyte as it leaves the electrolytic cell or cells is maintained at a temperature in the range 90° to 100° C.

4,125,444

ELECTROCHEMICAL POLISHING METHOD

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Dec. 13, 1977, Ser. No. 860,243
Claims priority, application Japan, Dec. 14, 1976, 51-150051; Jun. 10, 1977, 52-69129; Sep. 21, 1977, 52-113273
Int. Cl.[2] C25F *3/24, 3/16*
U.S. Cl. 204—129.43 **17 Claims**



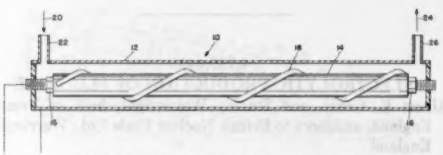
1. A method of electrochemical polishing in which an electric current in the form of pulses is applied between a workpiece and a tool electrode juxtaposed therewith in the presence of an electrolyte, the pulses having a pulse duration not greater than 100 microseconds.

4,125,445

ELECTROREDUCTION OF NITRATE ESTERS

Eldon K. Hurley, Carthage, Mo., assignor to Hercules Incorporated, Wilmington, Del.

Filed May 20, 1977, Ser. No. 799,028
Int. Cl.[2] C02C *5/12*
U.S. Cl. 204—149 **19 Claims**



1. A method for the treatment of waste water containing various contaminants comprising:
providing an electrolytic cell;
introducing into said electrolytic cell a waste water solution containing contaminants selected from the group consisting of nitrate esters and nitro compounds;
establishing current flow in said electrolytic cell to cause cathodic reduction of the nitrogen present in said contaminants to remove said contaminants therefrom; and
removing said waste water solution from said electrolytic cell.

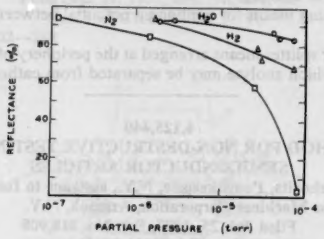
4,125,446

CONTROLLED REFLECTANCE OF SPUTTERED ALUMINUM LAYERS

Larry D. Hartsough, and Paul S. McLeod, both of Berkeley, Calif., assignors to Airco, Inc., Montvale, N.J.

Filed Aug. 15, 1977, Ser. No. 824,682
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—192 P **11 Claims**

1. A method for depositing an aluminum layer having a predetermined reflectance comprising:
placing a target comprising at least 90% aluminum and a substrate in a evacuable chamber;
evacuating the chamber;
introducing a reactive gas into the chamber at a controlled rate to provide a predetermined partial pressure of 10^{-7} to 10^{-4} torr;
providing an ionizable inert gas in the chamber to maintain the total pressure of 5×10^{-4} to 5×10^{-2} torr;



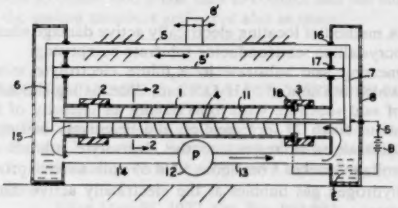
and applying an electric potential to the target to sputter the target and deposit a layer of material on the substrate.

4,125,447

MEANS FOR PLATING THE INNER SURFACE OF TUBES

Karl R. Bachert, 386 Woodward Ave., Brooklyn, N.Y. 11237

Filed Mar. 24, 1978, Ser. No. 889,631
Int. Cl.[2] C25D *17/00, 17/10, 21/10*
U.S. Cl. 204—222 **1 Claim**



1. Means for plating the inside of hollow open ended members comprising,
means to mount a tube to be plated including means to seal the ends of the tube,
an anode,
oscillatable means adapted to mount the anode so that the anode extends through the hollow member,
means connected to circulate an electrolyte through the hollow member,
a source of electricity connected between the anode and the inside surface of the hollow member, and
a plurality of insulating bristles mounted on the anode to scrub the interior surface of the tube as the anode vibrates, and maintain the concentricity of the anode to provide a more uniform plating.

4,125,448

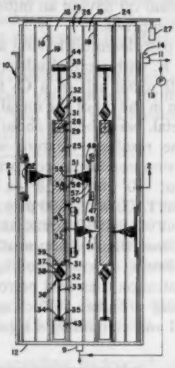
CELL AND ELECTRODES FOR ELECTROLYTIC PRODUCTION OF INSOLUBLE METAL HYDROXIDE

Paul S. Roller, 1440 N. St., NW. (#208), Washington, D.C. 20005

Continuation-in-part of Ser. No. 444,790, Feb. 22, 1974, Pat. No. 3,960,695. This application Apr. 20, 1976, Ser. No. 674,099
Int. Cl.[2] C25B *9/04, 1/16, 11/04*
U.S. Cl. 204—268 **10 Claims**

1. An electrode comprised of a substantially rectangular metal plate for the anodic electrolytic production from the surface of said plate of a hydroxide of said metal substantially

insoluble in an aqueous liquid for said electrode, said plate having a contact element of a conducting material substantially non-corrodible in said aqueous liquid fixed on an end thereof, said contact element adapted to make surface contact with a current lead-in for said electrode, whereby metal hydroxide production of said plate may proceed without resistance to the current supply thereto.



4,125,449

TRANSITION METAL OXIDE ELECTRODES

David L. Lewis, Mentor; Larry A. Schenke, University Heights; Mary R. Suchanski, Mentor, all of Ohio, and C. Richard Franks, deceased, late of North Madison, Ohio (by Margaret S. Yarcusko, executrix), assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 644,639, Dec. 29, 1975, Pat. No. 4,028,215. This application May 23, 1977, Ser. No. 799,591

Int. Cl.[2] C25B *11/04, 11/10*

U.S. Cl. 204—290 F **5 Claims**

1. An electrode for use in an electrolytic cell comprising: a valve metal substrate selected from the group of aluminum, molybdenum, niobium, tantalum, titanium, tungsten, zirconium and alloys thereof; on the surface of said valve metal substrate, a semi-conductive intermediate coating of tin and antimony compounds applied and converted to their respective oxides such that said semi-conductive intermediate coating attains a weight greater than 2 grams per square meter of said valve metal substrate surface area; and on the surface of said semi-conductive intermediate coating, a top coating consisting of oxides of transition metals selected from the group consisting of chromium, iron, cobalt, nickel, molybdenum, and tungsten such that said top coating attains a weight greater than 25 grams per square meter of said valve metal substrate surface area.

4,125,450

PREVIOUS DIAPHRAGMS FOR CELLS FOR THE ELECTROLYSIS OF AQUEOUS SOLUTIONS OF ALKALI METAL HALIDES

Louis Degueldre, and Edgard Nicolas, both of Brussels, Belgium, assignors to Solvay & Cie, Belgium

Filed Apr. 1, 1977, Ser. No. 783,822

Claims priority, application Luxembourg, Apr. 26, 1976, 74835

Int. Cl.[2] C25B *13/06, 13/08;* **B01D** *39/00*

U.S. Cl. 204—296 **25 Claims**

1. Pervious diaphragms for cells for the electrolysis of aqueous solutions of alkali metal halides comprising inorganic fibers and a polymer dispersed throughout the inorganic fibrous mass, wherein the polymer is selected from water soluble polyelectrolytes insoluble in said aqueous solutions of alkali metal halides.

4,125,451

DIAPHRAGMS FROM DISCRETE THERMOPLASTIC FIBERS REQUIRING NO BONDING OR CEMENTING

Arvind S. Patil, Grosse Ile, and Eugene Yehuda Weissman, Birmingham, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 566,911, Apr. 10, 1975, Pat. No. 4,036,729. This application Apr. 27, 1977, Ser. No. 791,497

The portion of the term of this patent subsequent to Jul. 19, 1994, has been disclaimed.

Int. Cl.[2] C25B *13/04, 13/08*

U.S. Cl. 204—296 **7 Claims**

1. In an electrolytic cell having a diaphragm deposited on a cathode screen, an improved diaphragm therefor, said diaphragm consisting essentially of

an entanglement of highly branched thermoplastic polymeric fibers, the fibers being capable of withstanding the internal conditions of the cell, the fibers being of the type produced by passing a polymer through a nozzle under high-energy conditions in the presence of an auxiliary liquid medium which shears the polymer into highly branched fibers, and

wherein fibers are entangled to a degree such that they are free from bonding or cementing agents.

4,125,452

INTEGRATED COAL LIQUEFACTION PROCESS

Edward Effron, Springfield, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Jun. 10, 1977, Ser. No. 805,366

Int. Cl.[2] C10G *1/04, 1/08, 17/00*

U.S. Cl. 208—8 **18 Claims**

1. In a process wherein coal or similar carbonaceous solids containing combined oxygen are liquefied at elevated temperature and pressure in a liquefaction zone in the presence of a hydrocarbon solvent to produce coal liquids and at least part of said coal liquids are thereafter hydrogenated in a catalytic hydrogenation zone, the improvement which comprises recovering coal liquids from said liquefaction zone, extracting at least part of the recovered coal liquids with an aqueous solvent in which oxygenated compounds formed during liquefaction are soluble to produce a hydrocarbon raffinate phase and an aqueous extract phase containing said oxygenated compounds, hydrogenating at least part of said raffinate phase in said hydrogenation zone, and gasifying said oxygenated compounds contained in said extract phase to produce a synthesis gas containing hydrogen and carbon monoxide.

4,125,453

SPOUTED-BED SHALE RETORTING PROCESS

Paul W. Tamm, Oakland, and Christopher W. Kuehler, Larkspur, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 754,197, Dec. 27, 1976, abandoned. This application Mar. 10, 1978, Ser. No. 885,244

Int. Cl.[2] C10G *1/02*

U.S. Cl. 208—11 R **8 Claims**

1. A continuous process for retorting oil shale which comprises:

(a) directing a jet of essentially oxygen-free gas comprising recycled light product gas substantially vertically at a linear velocity of 50 to 150 feet per second up into a vessel containing subdivided solids including oil shale and heat-transfer solids, thereby forming a spouted bed of said solids in said vessel, said spouted-bed comprising as the minor volume of said bed, a relatively rapidly moving upward spout of said solids, and as the major volume of said bed a downwardly, relatively slowly moving, annu-

lar, columnar, loosely packed body of said solids, a portion of said gas flowing upwardly countercurrently to said solids in said annular body for stripping vaporized hydrocarbons from said solids in said annular body;

(b) continuously introducing into said vessel heat-transfer solids, at an elevated temperature of at least 1000° F., and oil shale, said heat-transfer solids and oil shale being introduced into said vessel by entrainment in said jet of gas;

(c) continuously withdrawing retorted solids and said heat-transfer solids from said vessel, said retorted solids and said heat-transfer solids being withdrawn from a lower portion of the body portion of said spouted bed; and

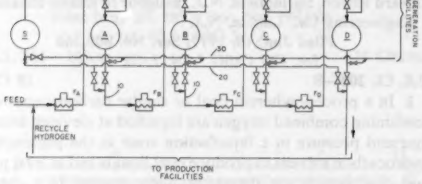
(d) continuously withdrawing vaporized hydrocarbons from an upper portion of said vessel.

4,125,454

PROCESS FOR SUPPRESSION OF CATALYST DEACTIVATION AND C_5+ LIQUID YIELD LOSS IN A CYCLIC REFORMING UNIT

Kenneth R. Clem; George A. Swan, both of Baton Rouge, La., and Louis Dauber, Cranford, N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Nov. 14, 1977, Ser. No. 851,060
Int. Cl.² C10G *35/08*
U.S. Cl. 208—65 **9 Claims**



1. In a process for reforming a naphtha in a cyclic reforming unit which contains a plurality of catalyst-containing on stream reactors connected in series, and a catalyst-containing swing reactor which, due to an arrangement of process piping and valves comprising headers, can be substituted for any one of the on stream reactors while the latter is off stream for regeneration and reactivation of the catalyst, the naphtha feed flowing from one reactor of the series to another to contact the catalyst contained therein at reforming conditions, the improvement comprising

maintaining on stream, after return to service of an upstream reactor which contains freshly regenerated and reactivated catalyst, a reactor immediately downstream of and next in series with said upstream reactor which contains a near deactivated catalyst which is next to be regenerated and reactivated, such that on the introduction of naphtha into contact with the regenerated, reactivated catalyst of said immediate upstream reactor at reforming conditions sulfur is desorbed from the catalyst,

continuing to maintain said downstream reactor which contains the near deactivated catalyst on stream while the sulfur that is released by the catalyst of said upstream reactor is adsorbed on said near deactivated catalyst,

connecting the swing reactor in parallel with said reactor which contains the near deactivated catalyst on which sulfur is being adsorbed, and then

disconnecting and removing from series said reactor containing the near deactivated catalyst prior to the desorption and release of major amounts of sulfur from the catalyst of said reactor.

4,125,455

HYDROTREATING HEAVY RESIDUAL OILS

Sheldon Herbstman, Spring Valley, N.Y., assignor to Texaco Inc., New York, N.Y.

Continuation of Ser. No. 400,866, Sep. 26, 1973, abandoned. This application Jul. 13, 1977, Ser. No. 816,417
Int. Cl.² C10G *13/06*; B01J *27/04*
U.S. Cl. 208—108 **11 Claims**

1. A process for the catalytic hydroconversion of a sulfur-containing petroleum oil having an initial boiling point above 1,000° F. which comprises:

(a) admixing a petroleum oil having an initial boiling point above 1,000° F. with a metal salt consisting essentially of a Group VIB metal salt of a C_7 to C_{32} fatty acid, the concentration in the oil of the metal salt, calculated as the elemental metal, being below about 1,000 ppm,

(b) reacting the resultant mixture with hydrogen under hydroconversion conditions comprising a temperature of between about 750° and 900° F., a hydrogen pressure of between about 1,500 and 2,500 psig and a reaction time of between about 0.1 and 10 hours, and

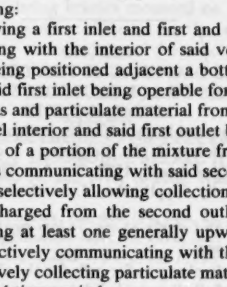
(c) recovering from the reaction mixture of step (b), (1) an oil fraction having a lower boiling range and a lower sulfur concentration than said petroleum oil and (2) a tar fraction having a higher sulfur concentration than said petroleum oil and containing a significant portion of said metal salt.

4,125,456

METHOD AND APPARATUS FOR SEPARATING PARTICULATE MATERIALS

Eulas W. Henderson, Toledo, Ohio, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 22, 1977, Ser. No. 780,206
Int. Cl.² B07B *7/00*
U.S. Cl. 209—140 **8 Claims**



1. An apparatus for separating particulate materials, said apparatus including:

(a) a vessel having a first inlet and first and second outlets communicating with the interior of said vessel, said second outlet being positioned adjacent a bottom portion of the vessel, said first inlet being operable for introducing a mixture of gas and particulate material from a first source into the vessel interior and said first outlet being operable for discharge of a portion of the mixture from the vessel;

(b) valve means communicating with said second outlet and operable for selectively allowing collection of particulate material discharged from the second outlet, said valve means forming at least one generally upwardly opening chamber selectively communicating with the second outlet for selectively collecting particulate material for a first predetermined time period;

(c) second inlet means connected to a source of gas and opening into a lower disposed portion of said chamber and

operable for introducing a gas into said lower disposed portion;

(d) first means connecting said second inlet means to a source of gas, said first means including means for sequentially allowing gas to flow into said chamber for effecting sequential uplifting of certain particulate material contained in the chamber for a second predetermined time period during a latter portion of the first predetermined time period, said first means and valve means being timed for operation relative to one another whereby said valve means effects discharge of collected particulate material immediately after the second predededetermined time period;

(e) third inlet means opening into said second outlet between said vessel and said valve means forming an elutriation chamber portion, said third inlet means being connected to a source of gas.

4,125,457
PROCESS OF TREATING LUBRICATING OILS WITH ACIDIFIED SORBENT

James A. Brennan, Cherry Hill, and Stanley J. Lucki, Runnemede, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

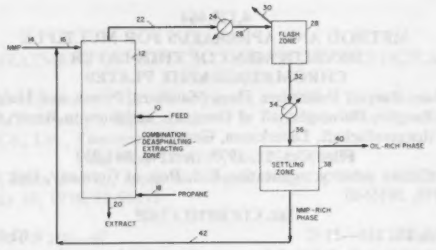
Filed Sep. 2, 1977, Ser. No. 830,251
Int. Cl.[2] C10G *25/00*
U.S. Cl. 208—254 R **8 Claims**

1. A process for upgrading hydrocarbon lubricating oils, improving the oxidative stability thereof and substantially removing polar compounds normally contained therein, which comprises contacting said lubricating oil with an acidified sorbent selected from the group consisting of alumina, silica-alumina and bauxite said sorbent having been treated to contain at least 3% by weight based on the total weight of said sorbent of an ion selected from the group consisting of sulfate, chloride or bromide, said contacting being carried out at a temperature within the range of ambient to about 250° F and an LHSV within the range of about 0.1 to about 10.

4,125,458
SIMULTANEOUS DEASPHALTING-EXTRACTION PROCESS

James D. Bushnell, Berkeley Heights, N.J.; Alexandr P. Glivicky, Sarnia, Canada; Milton D. Leighton, Florham Park, N.J., and Bruce M. Sankey, Sarnia, Canada, assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 847,014, Oct. 31, 1977, abandoned, which is a continuation of Ser. No. 683,376, May 5, 1976, abandoned. This application Dec. 22, 1977, Ser. No. 863,585
Int. Cl.[2] C10G *21/04*
U.S. Cl. 208—309 **11 Claims**



1. A process for simultaneously solvent-deasphalting and extracting a mineral oil feedstock containing asphaltic and aromatic components which comprises the steps of:

(1) contacting said feedstock in a combination deasphalting-extracting zone with a solvent comprising a mixture of (a) NMP containing from 0–5 LV% water and (b) one or more liquid, low molecular weight C_2–C_{10} carbon atom hydrocarbons to form two layers or phases, an upper raffinate phase containing the desired oil, most of the hydrocarbon solvent and some NMP and a lower, extract layer or phase containing asphalt and most of the NMP;

(2) removing the raffinate from said combination zone and heating same to a temperature ranging from between 180° to 450° F.;

(3) passing said hot raffinate from step (2) to a flash zone to remove most of the hydrocarbon solvent therefrom as vapor to produce a hydrocarbon solvent-reduced raffinate;

(4) chilling said hydrocarbon solvent-reduced raffinate to a temperature sufficiently low to produce bulk liquid-liquid immiscibility between the raffinate oil and the NMP, thereby forming two phases or layers, an oil-rich light phase and an NMP-rich heavy phase containing some oil and most of the NMP present in the raffinate formed in step (1) above;

(5) separating the oil-rich phase from the NMP-rich phase; and

(6) passing said NMP-rich phase back into said combination zone.

4,125,459
HYDROCARBON SOLVENT TREATMENT OF BITUMINOUS MATERIALS

Leo Garwin, Oklahoma City, Okla., assignor to Kerr-McGee Refining Corporation, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 782,116, Mar. 28, 1977, abandoned. This application Dec. 19, 1977, Ser. No. 861,858
Int. Cl.[2] C10C *3/08*
U.S. Cl. 208—309 **4 Claims**

1. In the process which comprises treating a bituminous material to separate same into at least two fractions by contacting said bituminous material with a first solvent in a first treating zone at elevated temperature and pressure to cause said bituminous material to separate into a first light fraction and withdrawing the first light fraction and the first heavy fraction for recovery, and then contacting at least a portion of said first heavy fraction with a second solvent in a second treating zone at an elevated temperature and pressure to cause said first heavy fraction to separate into a second light fraction comprising substantially oils and resins and a second heavy fraction which are withdrawn separately for recovery, the improvement which comprises:

recycling at least a portion of the second light fraction to the first treating zone to separate and recover additional high quality oils from the bituminous material.

4,125,460
MAGNETIC BENEFICIATION OF CLAYS UTILIZING MAGNETIC PARTICULATES

Alan J. Nott, Crantock nr. Newquay, England, and William M. Price, Tennille, Ga., assignors to Anglo-American Clays Corporation, Sandersville, Ga.

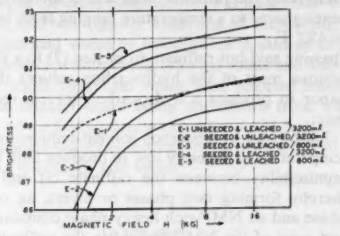
Continuation of Ser. No. 618,347, Oct. 1, 1975, Pat. No. 4,087,004. This application Dec. 22, 1976, Ser. No. 753,201
The portion of the term of this patent subsequent to May 2, 1995, has been disclaimed.
Int. Cl.[2] B03C *1/00*
U.S. Cl. 209—8 **11 Claims**

1. A method for magnetically separating discoloring titaniferous contaminants of low magnetic attractability from a crude kaolin clay, comprising the steps of:

forming a dispersed aqueous slurry of said clay;

seeding said slurry with a particulate selected from one or more members of the group consisting of (1) a finely divided ferrimagnetic powder wherein at least 50% by weight of the particles thereof are of less than 30 microns E.S.D.; (2) an aqueous unpeptized precipitate of a magnetic ferrite, the particles of which are of predominantly

colloidal size; and (3) an aqueous peptized precipitate of a magnetic ferrite, the particles of which are of predominantly colloidal size and are dispersed in a substantially entirely and uniformly aqueous phase; and


BRIGHTNESS
MAGNETIC FIELD H (KG)
E-1 UNSEEDED & LEACHED 3200-Å
E-2 SEEDED & UNLEACHED/ 3200-Å
E-3 SEEDED & UNLEACHED/ 800-Å
E-4 SEEDED & LEACHED 3200-Å
E-5 SEEDED & LEACHED 800-Å

subjecting the seeded slurry to a magnetic separation by passing said slurry through a porous ferromagnetic matrix positioned in a magnetic field having an intensity in the range of from about 0.5 to 5 kG, to remove said titaniferous contaminants seeded by said particulate.

4,125,461

DEMULSIFICATION BY CENTRIFUGATION FOLLOWED BY STRONG SHEARING

Norman N. Li, Edison, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 677,527, Apr. 16, 1976, abandoned. This application Jul. 18, 1977, Ser. No. 816,290

Int. Cl.[2] B01D *13/00*

U.S. Cl. 210—22 R **27 Claims**

1. A process for separating a liquid dispersed phase present as droplets in a liquid continuous phase of an emulsion comprising:

(a) increasing the weight ratio of the liquid dispersed phase to the liquid continuous phase of the emulsion by removal of a portion of the continuous phase of the emulsion;

(b) combining the remaining emulsion with a liquid miscible with said liquid dispersed phase of said emulsion;

(c) shearing the resulting combination so that said continuous phase between adjacent droplets of said dispersed phase is ruptured such that a substantial portion of said dispersed phase is coalesced and said dispersed phase and miscible liquid separate from said continuous phase.

4,125,462

COATED MEMBRANES

James Latty, Seal Beach, Calif., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Aug. 30, 1977, Ser. No. 829,040

Int. Cl.[2] B01D *13/00*

U.S. Cl. 210—23 F **16 Claims**

12. A method of ion-rejecting a solution containing solubilized ionic materials which comprises passing said solution over an ion-rejecting membrane comprising a semipermeable membrane substrate having affixed thereto a thin coating or layer of a polymeric cationic polyelectrolyte, said polymeric cationic polyelectrolyte being poly(vinylimidazoline) in the busulfate form.

4,125,463

REVERSE OSMOSIS DESALINATION APPARATUS AND METHOD

James W. Chenoweth, 4145 San Carlos, Dallas, Tex. 75205

Filed Oct. 27, 1977, Ser. No. 845,850

Int. Cl.[2] B01D *13/00*

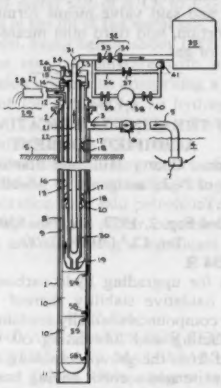
U.S. Cl. 210—23 H **28 Claims**

1. A well system for desalination of salt water by reverse osmosis comprising:

first tubular means placed in a well hole drilled therefor and having an inlet near the surface of said well through which salt water may be introduced into said first tubular means from a salt water source;

second tubular means centrally disposed within said first tubular means leaving a first annular space therebetween for holding said salt water;

at least one permeator, disposed within said first tubular means near the lower end of said second tubular means, having osmotic membranes therein which permit, in response to predetermined differential pressure thereacross, passage of salt-free water from said salt water from the high pressure side to the low pressure side thereof, leaving



concentrated salt water on said high pressure side, said permeator means having an inlet in fluid communication with said first annular space for receiving said salt water therefrom, a first outlet on the high pressure side of said membranes for allowing exit of said concentrated salt and water and a second outlet on the low pressure side of said membranes for allowing the exit of said salt-free water; said permeator being at a depth within said first tubular means at which the static head of said salt water in said first annular space is sufficient to create the necessary differential pressure across said osmotic membranes of said permeator means for permitting said passage of said salt-free water therethrough.

4,125,464

METHOD AND APPARATUS FOR MULTIPLE DEVELOPMENT OF THIN-LAYER CHROMATOGRAPHY PLATES

Klaus Burger, Dormagen; Hans Mausberg, Neuss, and Hubert Tengler, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 11, 1977, Ser. No. 841,237

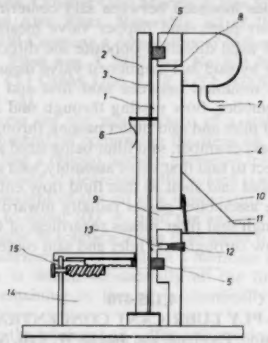
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1976, 2646640

Int. Cl.[2] B01D *15/08*

U.S. Cl. 210—31 C **4 Claims**

1. A method for the automatic multiple development of thin-layer chromatography plates comprising: forming a sealed chamber in conjunction with a portion of the active surface of a thin layer chromatography plate; contacting a portion of the plate not within the chamber with a mobile phase to initiate development; applying the substance to be analyzed to the chromatography plate by directing it into the sealed chamber before or just after the contacting step; interrupting the distri-

bution by drying by introducing a laminar inert gas stream into the chamber after a preselected migration; repeating the steps



of development and drying at least once while maintaining the sealed chamber.

4,125,465

METHOD OF EFFLUENT SLUDGE TREATMENT

Izrail S. Turovsky, Molodezhnaya ulitsa, 3, kv. 292; Leonic L. Goldfarb, Uralskaya ulitsa, 6, korpus 6, kv. 48; Leonid V. Zamoschin, Leninsky prospekt, 144, korpus 5, kv. 48, and Alexandr I. Zhukov, pereulok M. Gorkogo, 4, kv. 5, all of Moscow, U.S.S.R.

Continuation of Ser. No. 571,021, Apr. 22, 1975, abandoned. This application Oct. 18, 1976, Ser. No. 733,341

Int. Cl.[2] B01D *21/01*

U.S. Cl. 210—46 **5 Claims**

1. A method of treating effluent sludge, which comprises treating sludge with mineral coagulants so as to coagulate the sludge; mechanically dehydrating the resulting sludge; drying the dehydrated sludge to a moisture content of from 10 to 50 percent by means of a gaseous heat carrier having an initial temperature of from 600° to 800° C. under counter-jet and air-gushing conditions; introducing at the coagulation stage dried sludge into the starting sludge at a rate so that a concentration of the sludge mixture thus obtained is from 50 to 120 g/lit.

4,125,466

TREATMENT OF SLUDGE COMPRISING BIOLOGICAL AGGREGATE

Isao Miyanohara; Hiroshi Miyazaki, and Hideo Kawamura, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed May 18, 1977, Ser. No. 798,171

Claims priority, application Japan, May 18, 1976, 51-56114; May 18, 1976, 51-56115

Int. Cl.[2] C02C *3/00*

U.S. Cl. 210—67 **2 Claims**

1. A method of treating sludge comprising biological aggregate which comprises adding to said sludge from 5 to 30 wt.% of a magnesium compound selected from the group consisting of magnesium hydroxide, magnesium chloride, magnesium sulfate and magnesium carbonate based on the solid component in said sludge; adding a base to maintain the pH of the sludge at greater than 9.5; and subsequently filtering said sludge.

4,125,467

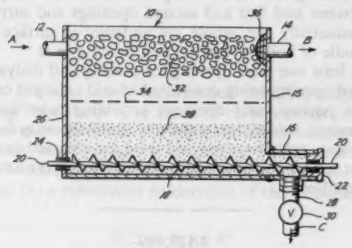
LIQUID-SOLIDS SEPARATOR

Philip O. Haddad, Alvin, and Kenneth R. Colura, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 3, 1977, Ser. No. 765,183

Int. Cl.[2] B01D *21/02*

U.S. Cl. 210—83 **14 Claims**



7. A method for separating the solids from the liquid of a flowing suspension in a manner such that ready adjustment of the degree of separation of the solids from the liquid can be obtained, said method comprising:

(a) flowing the suspension through a container in which are maintained a multiplicity of disconnected, substantially non-nesting contactors in at least one cross-sectional volume of the flowpath of the suspension to cause the faster gravitational separation of the liquid and solids, with said contactors having contact surfaces which are substantially non-planar and a density less than the suspension;

(b) observing the degree of separation of the liquids and solids of the suspension after it has passed through the contactors; and

(c) adjusting the contactors in number, size, and type until they produce the desired degree of separation of solids from the liquid of the suspension.

4,125,468

HOLLOW-FIBER PERMEABILITY APPARATUS

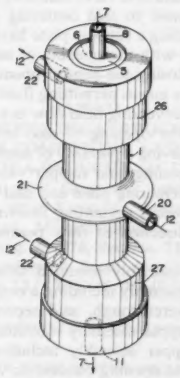
Yasushi Joh, Yokohama, and Masahiro Yamazaki, Kamakura, both of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Jun. 3, 1977, Ser. No. 803,064

Claims priority, application Japan, Jun. 7, 1976, 51-66305

Int. Cl.[2] B01D *31/00*

U.S. Cl. 210—321 B **22 Claims**



1. In a hollow-fiber dialysis apparatus including a housing, a permeating region of the housing containing a bundle of hol-

low fibers, means for introducing a fluid for passage through the interiors of the fibers, and means for introducing a dialysate which flows around the exterior of the fibers whereby materials can selectively permeate through the fiber walls based on the principle of dialysis, the improvement comprising:

(a) at least one first opening and at least one second opening for passing said dialysate, said openings being formed in opposite end portions of said housing;

(b) an enlarged cross-section portion of said housing formed between said first and second openings and surrounding substantially the whole circumferential surface of said bundle of hollow fibers in said housing; and

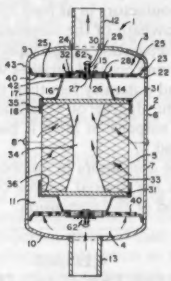
(c) at least one third opening for passing said dialysate, said third opening being connected to said enlarged cross-section portion, said openings providing inlet and outlet openings, said dialysate thereby simultaneously flowing in separate paths between said third opening and each of the first and second openings while contacting the exteriors of said fibers.

4,125,469

BI-DIRECTIONAL FILTER DRIER

Paul V. Henton, St. Louis, and Roger J. Fait, Manchester, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 15, 1977, Ser. No. 806,755
Int. Cl.[2] B01D *29/36*
U.S. Cl. 210—446 **10 Claims**



1. A bi-flow filter drier, comprising:

a shell, said shell defining a chamber, said shell including an inlet and an outlet communicating with said chamber;

a first valve assembly mounted in said chamber, said valve assembly including a centering plate having an opening therethrough, said first valve assembly including a flapper assembly mounted to said centering plate, said flapper assembly including a support plate having a central opening concentric with the opening of said centering plate, valve means closing the central opening of said support plate, said valve means permitting fluid flow in a first axial direction and preventing fluid flow in a second axial direction through the opening of said centering plate, said support plate having a plurality of satellite openings about said central opening, and flapper valve means mounted between said centering plate and said support plate, said flapper valve means permitting flow in an axial direction opposite the direction of flow permitted by said valve means;

a second valve assembly mounted in said chamber, said second valve assembly including a centering plate having an opening therethrough, said second valve assembly including a flapper assembly mounted to said centering plate, said flapper assembly including a support plate having a central opening concentric with the opening of said centering plate, valve means closing the central opening of said support plate, said valve means permitting fluid flow in the second axial direction and preventing fluid flow in the first axial direction through the opening of said centering plate, said support plate having a plurality of satellite opening about said central opening, and flapper valve means mounted between said centering plate and said support plate, said flapper valve means permitting flow in an axial direction opposite the direction of flow permitting by said last mentioned valve means; and

filter means mounted between said first and said second valve assemblies, flow passing through said chamber between said inlet and said outlet passing through said filter means in said chamber, said filter being sized and arranged with respect to said first valve assembly, said second valve assembly and said shell so that fluid flow entering one of said valve assemblies passes radially inwardly from said shell through said filter means regardless of the direction of first flow through said inlet and said outlet.

4,125,470

BAND-PLY LUBRICANT CONCENTRATES

William N. Fenton, Freeland, and Joseph W. Keil, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Apr. 2, 1976, Ser. No. 672,932
Int. Cl.[2] C10M *1//12*
U.S. Cl. 252—27 **16 Claims**

1. A composition consisting of (A) about 39 to 75 percent by weight of an alkylene oxide polymer having a molecular weight of at least 500 and in which the alkylene oxide units are selected from the group consisting of ethylene oxide units and propylene oxide units, (B) about 1 to 15 percent by weight of a siloxane copolymer selected from the group consisting of

(1) copolymers consisting essentially of SiO_2 units, $(CH_3)_3SiO_{1/2}$ units and $D(CH_3)_2SiO_{1/2}$ in which D is a polyoxyethylene polymer having a molecular weight of at least 2000, or a polyoxyethylene-polyoxypropylene copolymer having a molecular weight of at least 2500 and the polyoxypropylene portion constitutes up to 50 mole percent of the organic portion of the copolymer, said D being attached to the silicon atom via a silicon-carbon bond, the ratio of the SiO_2 units to the total $(CH_3)_3SiO_{1/2}$ and $D(CH_3)_2SiO_{1/2}$ units being in the range of 1:0.4 to 1:1.2,

(2) copolymers which are reaction products derived from heating a mixture of a siloxane consisting essentially of SiO_2 units and $(CH_3)_3SiO_{1/2}$ units in which the ratio of SiO_2 units to $(CH_3)_3SiO_{1/2}$ units is in the range of 1:0.4 to 1:1.2, and a hydroxylated polyoxyethylene polymer having a molecular weight of at least 2000 or a hydroxylated polyoxyethylene-polyoxypropylene copolymer having a molecular weight of at least 2500 and the polyoxypropylene constitutes up to 50 mole percent of the organic portion of the copolymer,

(3) polydimethylsiloxane-organic copolymers in which the polydimethylsiloxane portion has a molecular weight of at least 2000 and the organic portion consists essentially of a polyoxyethylene polymer having a molecular weight of at least 800, or a polyoxyethylene-polyoxypropylene copolymer having a molecular weight of at least 1500 and the polyoxypropylene constitutes up to 50 mole percent of the organic portion of the copolymer said organic portion being attached to silicon atoms via silicon-carbon bonds, and

(4) polydimethylsiloxane-organic copolymers which are reaction products produced by heating a mixture of hydroxylated polydimethylsiloxanes having a molecular weight of at least 1500, and a hydroxylated polyoxyethylene polymer having a molecular weight of at least 800, or a hydroxylated polyoxyethylene-polyoxypropylene copolymer having a molecular weight of at least 1500 and the polyoxypropylene constitutes up to 50 mole percent of the organic portion of the copolymer, and

(C) about 21 to 55 percent by weight of a polydimethylsiloxane fluid having a viscosity in the range of 100 to 250,000 centistokes at 25° C.

4,125,471
SULFURIZED OIL

Paul C. Vienna, Calumet City; Marvin J. Den Herder, Olympia Fields, and Alex Zletz, Naperville, all of Ill., assignors to Standard Oil Company a corporation of Indiana, Chicago, Ill.

Filed Aug. 3, 1977, Ser. No. 821,393
Int. Cl.[2] C10M *3/06, 1/38, 3/32;* B21B *45/02*
U.S. Cl. 252—31 **14 Claims**

1. A process for the manufacture of a stable free sulfur containing mineral oil comprising the steps of:

(a) contacting a refined, solvent extracted lubricant oil with a first amount of elemental sulfur which is about 1 to about 5% by weight of the oil at a temperature of from about 375° F. to about 500° F. until the amount of the uncombined sulfur in solution is less than about 0.5% by weight of the lubricant oil to produce a lubricant oil-sulfur composition in which substantially all the first addition of sulfur remaining in the oil is chemically bound to oil molecules;

(b) cooling the lubricant oil-sulfur composition to a temperature from about 200° F. to 350° F.; and

(c) contacting the lubricant oil-sulfur composition with second amount of elemental sulfur in an amount which results in a stable sulfurized oil which contains less than 1.6% uncombined sulfur in which substantially all the second addition of sulfur is in solution.

7. A process to manufacture a sulfurized mineral lubricant oil solubilizing agent for elemental sulfur comprising the steps:

(a) contacting a refined, solvent extracted lubricant oil with from about 1% to about 5% by weight elemental sulfur based on lubricant oil;

(b) heating the elemental lubricant sulfur-oil mixture at a temperature of from about 375° F. to about 500° F. until the bulk of the sulfur has reacted with the oil and is chemically bound to the oil molecules and the uncombined sulfur concentration is less than 0.5% by weight of the oil;

(c) cooling the solubilizing agent.

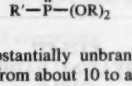
4,125,472
LUBRICANT COMPOSITIONS

Milton Braid, Westmont, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 733,580, Oct. 18, 1976, abandoned. This application Dec. 12, 1977, Ser. No. 859,406
Int. Cl.[2] C10M *1/44, 3/48;* C07D *233/04, 235/00*
U.S. Cl. 252—32.5 **21 Claims**

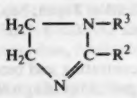
1. A lubricant composition which comprises: an oleaginous media; and an antiwear improving amount of the product formed by reacting, at a temperature greater than 150° C.,

(a) a dialkyl alkane phosphonate compound having the formula



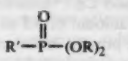
where R′ is a substantially unbranched paraffinic alkyl group containing from about 10 to about 36 carbon atoms and R is a hydrocarbyl group containing from 1 to about 4 carbon atoms with at least one hydrogen atom present on the carbon atom which is bonded to the oxygen; with at least the stoichiometric amount of

(b) a substituted imidazoline of the formula:

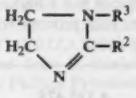


where one of the R^2 and R^3 substituents must be a substantially unbranched paraffinic or olefinic hydrocarbyl group containing from about 12 to about 35 carbon atoms; and the other R^2 or R^3 substituent is selected from the group consisting of: paraffinic alkyl containing from 1 to about 35 carbon atoms, alkenyl containing from 1 to about 35 carbon atoms and hydroxy-, alkoxy-, alkoxymethoxy-, and oxo-substituted alkyl and alkenyl containing from 1 to about 20 carbon atoms.

14. A product formed by reacting, at a temperature greater than 150° C., (a) a dialkyl alkane phosphonate compound having the formula



where R′ is a substantially unbranched paraffinic alkyl group containing from about 10 to about 36 carbon atoms and R is a hydrocarbyl group containing from 1 to about 4 carbon atoms with at least one hydrogen atom present on the carbon atom which is bonded to the oxygen; with at least the stoichiometric amount of (b) a substituted imidazoline of the formula:



where one of the R^2 and R^3 substituents must be a substantially unbranched paraffinic or olefinic hydrocarbyl group containing from about 12 to about 35 carbon atoms; and the other R^2 or R^3 substituent is selected from the group consisting of: paraffinic alkyl containing from 1 to about 35 carbon atoms, alkenyl containing from 1 to about 35 carbon atoms; and hydroxy-, alkoxy-, alkoxymethoxy-, and oxo-substituted alkyl and alkenyl containing from 1 to about 20 carbon atoms.

4,125,473
POLYCRYSTALLINE FERRIMAGNETIC GARNET HAVING A NARROW GYROMAGNETIC RESONANCE LINE WIDTH AND A LOW MAGNETIC MOMENT

Roland Sroussi, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 25, 1977, Ser. No. 844,916
Claims priority, application France, Oct. 26, 1976, 76 32241
Int. Cl.[2] C04B *35/40*
U.S. Cl. 252—62.57 **3 Claims**

1. A polycrystalline ferrimagnetic garnet characterized by a magnetic moment of less than 600 g, a resonance line width of less than 100 Oe and, having the formula:

$$Y_{3-x-y}Ca_{x+y}Fe_{5-x-y}Ge_xZr_yO_{12} \quad [1]$$

with

$0.75 \leqq x \leqq 0.85$
$0.05 \leqq y \leqq 0.35$.

4,125,474
PROCESS FOR PRODUCING FERROGMAGNETIC IRON OXIDE POWDER COMPRISING A PRE-TREATMENT WITH A REDUCING AGENT

Shin-Ichiro Dezawa; Koji Sasazawa; Tatsuji Kitamoto, and Nobuo Yamazaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Filed Aug. 2, 1976, Ser. No. 710,813
Claims priority, application Japan, Aug. 1, 1975, 50-93828
Int. Cl.[2] C01G *49/06, 49/08*
U.S. Cl. 252—62.62 **14 Claims**

1. A process for producing a ferromagnetic iron oxide which comprises:

treating a water or water-miscible organic solvent suspension of a ferromagnetic iron oxide with a reducing agent present in said suspension for a period of 3 minutes to 5 hours, removing any unoxidized reducing agent, adding an aqueous solution containing Co^{+2} ions or Co^{+2} ions

and one or more other metal ions and an alkali solution to the suspension and heating; wherein:

said reducing agent is used in an amount of 0.01 to 30 weight % based on the iron oxide and said reducing agent has a standard electrode potential of not greater than −0.4 V;

said ferromagnetic iron oxide is maghemite, magnetite, FeOx where $1.33 < x < 1.50$, or partially oxidized metallic iron;

said Co^{+2} ions or said Co^{+2} ions and the other metal ions are present in an amount of 0.5 to 10 atomic % based on the amount of Fe present in the iron oxides;

said other metal ions are selected from the group consisting of Cr^{+3}, Cr^{+6}, Mn^{+2}, Fe^{+2}, Fe^{+3}, Ni^{+2} and Zn^{+2}, and when said other metal ions are present, the ratio of Co^{+2} ions to the other metal ions is at least 1/3;

said alkali is present in an amount such that the hydroxyl ion concentration after neutralizing the Co^{+2} ions or Co^{+2} and said other metal ions is at least 0.5 N;

said heating is at 8°–150° C and; wherein the ferromagnetic iron oxide so produced has a higher coercive force than that obtained from said process without said treatment with said reducing agent.

4,125,475

DETERGENTS CONTAINING A FATTY ALCOHOL BUILDER AND A WATER-INSOLUBLE INORGANIC ABSORBENT

Jack H. Kolaian, Wappingers Falls; Frederic C. McCoy, Beacon, and John A. Patterson, Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 535,758, Dec. 23, 1974, Pat. No. 4,056,355. This application Jun. 23, 1977, Ser. No. 809,500

Int. Cl.[2] C11D *1/68, 7/20, 7/26, 17/06*

U.S. Cl. 252—89 R **4 Claims**

1. A free-flowing solid homogeneous detergent composition suitable for laundering soiled cotton, consisting essentially of:

(a) from about 5 to 45 parts by weight of at least one fatty alcohol surfactant containing 6 to 18 carbon atoms, said alcohol or alcohols being the sole surfactant present;

(b) from about 5 to 95 parts by weight of inorganic builder selected from the group consisting of sodium carbonate, sodium bicarbonate, sodium metasilicate, sodium sulfate, sodium chloride, sodium orthosilicate, and sodium sesquicarbonate;

(c) from about 1 to 10 parts by weight of at least one of the following detergent adjuvants: anti-redeposition-compounds, heavy metal sequestering agents, optical bleach agents, whitening agents, corrosion inhibitors, tarnish inhibitors, and germicides, and

(d) from about 5 to 45 parts by weight of finely divided, water-insoluble, chemically non-reactive inorganic absorbent, passing through a 365 mesh sieve and having surface area of from about 30 to 300 M^2/g.

4,125,476

PAINT SPRAY BOOTH COMPOSITION

Ralph R. Dean, P.O. Box 1492, Fort Worth, Tex. 79901

Filed Mar. 10, 1977, Ser. No. 776,116

Int. Cl.[2] B08B *3/08;* **C09D** *9/00, 9/04;* **C23D** *17/00*

U.S. Cl. 252—115 **11 Claims**

1. A composition for trapping and removing paint from a paint spray booth, comprising an aqueous solution-suspension containing:

a. at least 4.0 percent by weight of a water softener selected from the class consisting of a neutralized gluco heptonate salt, sodium tripolyphosphate and neutralized ethylenediaminetetraacetic acid salt;

b. a concentration within the range of 4.0–25.0 percent by weight of a colloidal material that will pick up moisture and swell and remain stable in highly alkaline solutions; said colloidal material being selected from the class consisting of glue, starch, Kiesulguhr, dextrin, casein and clay;

c. a concentration within the range of 1–8 percent by weight of a synthetic surfactant; and

d. a concentration within the range of 5–50 percent by weight of an alkaline material selected from the class consisting of an alkali metal hydroxide and an alkali metal metasilicate;

and including a solubilizing, emulsifying and dispersing composition; said solubilizing, emulsifying and dispersing composition being present in a concentration within the range of 25–75 percent of the total composition and comprising a second aqueous solution that includes:

a. a concentration within the range of 1.1–13.9 percent by weight of pine oil;

b. a concentration within the range of 42–51 percent of aromatic naphtha;

c. a concentration within the range of 6.3–7.6 percent by weight of 2-butoxyethanol;

d. a concentration within the range of 13.9–16.2 percent by weight of tall oil fatty acid;

e. a concentration within the range of 2.8–4.6 percent by weight of an alkali metal hydroxide;

f. a concentration within the range of 2.3–9.3 percent by weight of a surfactant; and

g. a concentration within the range of 0.0005–1.0 percent by weight of a water softener selected from the class consisting of sodium phosphate, tripolyphosphate and ethylenediaminetetraacetic acid sodium salt.

11. A composition for trapping and removing paint from a paint spray booth and being employed to emulsify and couple paint formulations, comprising an aqueous solution-suspension containing:

a. at least 4.0 percent by weight of a water softener selected from the class consisting of a neutralized gluco heptonate salt, sodium tripolyphosphate and neutralized ethylenediaminetetraacetic acid salt;

b. a concentration within the range of 4.0–25.0 percent by weight of a colloidal material that will pick up moisture and swell and remain stable in highly alkaline solutions; said colloidal material being selected from the class consisting of glue, starch, Kiesulguhr, dextrin, casein and clay;

c. a concentration within the range of 1–8 percent by weight of a synthetic surfactant; and

d. a concentration within the range of 5–50 percent by weight of an alkaline material selected from the class consisting of an alkali metal hydroxide and an alkali metal metasilicate;

and including, based on the weight of the total composition, a concentration within the range of 5–25 percent by weight of 2-butoxyethanol and a concentration within the range of 5–25 percent by weight of cresylic acid.

4,125,477

PROCESS FOR TREATING RADIOACTIVE WASTE GASES

Akira Tani, Machida; Yoshiyuki Yuasa, Yokohama; Atsushi Watanabe, Kawasaki; Bunzai An, Kobe; Masataka Soya, Kobe, and Hiromi Tanabe, Kobe, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 9, 1976, Ser. No. 721,810

Claims priority, application Japan, Sep. 13, 1975, 50/111285

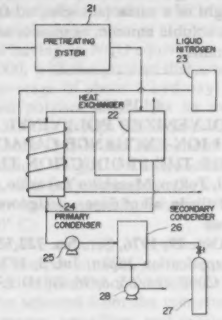
Int. Cl.[2] G21F *9/02*

U.S. Cl. 252—301.1 W **8 Claims**

1. A process for concentrating and recovering a radioactive rare gas from a waste gas comprising the steps of:

introducing a waste gas containing said radioactive rare gas and a mixture of oxygen and nitrogen into a primary condenser wherein said waste gas contacts a low temperature adsorption agent, and wherein said waste gas is concentrated, said concentrated waste gas containing a major

proportion of said mixture and a minor proportion of said radioactive rare gas at a ratio of about 10:1 to 6:1, and



treating said concentrated waste gas with one or more of the reactive metals selected from the group consisting of titanium, zirconium, and alloys thereof.

4,125,478

AIR TREATING GEL EMPLOYING AMIDE POLYMER GELLING AGENT

Edward J. Sullivan, and Giffin D. Jones, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 26, 1976, Ser. No. 745,258
Int. Cl.[2] B01J *13/00;* **A61K** *7/46;* **A61L** *13/00*
U.S. Cl. 252—316 **3 Claims**

1. In an air treating, gelable composition which composition comprises at least one volatile air treating agent and an aqueous gelling agent dispersed therein, the improvement wherein the gelling agent comprises (1) a polymer containing at least 80 mole percent of combined ethylenically unsaturated amide monomer, said polymer being substantially free of sulfite and bisulfite ions and (2) a hypohalite salt gelling reactant for said polymer, the hypohalite salt being employed as a solution having a pH at least about 12; the polymer and the reactant being present in proportions in the gelable composition to provide a firm aqueous gel medium.

4,125,479

OXIDATION INHIBITED LUBRICATING OIL

Ralph P. Chesluk, Nederland; John D. Askew, Jr., Houston, and Clifton C. Henderson, Port Arthur, all of Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 642,972, Dec. 22, 1975, abandoned. This application Dec. 13, 1976, Ser. No. 750,069
Int. Cl.[2] C10M *1/54*
U.S. Cl. 252—33.6 **4 Claims**

1. A lubricating oil comprising:
(a) a paraffinic base oil,
(b) methylene bis(dibutyl dithiocarbamate) comprising from about 0.1 to 4.0 weight percent of the total mixture and
(c) 4-methyl-2,6-ditertiary butyl phenol comprising from about 0.01 to 2.0 weight percent of the total mixture.

4,125,480

PROCESS FOR REACTIVATING USED SILVER ETHYLENE OXIDE CATALYSTS

Ian E. Maxwell, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 18, 1977, Ser. No. 843,199
Claims priority, application United Kingdom, Oct. 21, 1976, 43712/76
Int. Cl.[2] B01J *23/96;* **C07D** *301/10, 303/04*
U.S. Cl. 252—414 **5 Claims**

1. A process for improving the performance of used silver-based catalysts used for the production of ethylene oxide by contacting ethylene in the vapor phase with a molecular oxygen-containing gas at a temperature of from about 150°–300° C. which comprises:
(a) washing the used catalyst with 1–10 times its volume of water or a mixture of at least ten percent water with a water-miscible organic solvent, and
(b) depositing on the washed catalyst from about 0.00004 to about 0.008 gram equivalent weights per kilogram of total catalyst of alkali metal ions selected from the group consisting of sodium, potassium, rubidium, cesium, or mixtures thereof by impregnating the catalyst with a solution of alkali metal ions dissolved in a solvent selected from the group consisting of alkanols having 1 to 6 carbon atoms, acetone methyl acetate and tetrahydrofuran.

4,125,481

MIXING OF ORGANOSULFUR MOLECULAR WEIGHT MODIFIER WITH EMULSIFIER FOR EMULSION POLYMERIZATION SYSTEMS

Carl A. Uraneck, and John E. Burleigh, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 314,107, Dec. 11, 1972, Pat. No. 4,064,337. This application Aug. 18, 1977, Ser. No. 825,803
Int. Cl.[2] B01J *27/02*
U.S. Cl. 252—431 C **17 Claims**

1. In an admixture of emulsifier and organosulfur compound, useful in emulsion polymerization of olefinically unsaturated monomers, the improvement which comprises preparing said admixture by the process which comprises coagitation of at least one aqueous emulsifier with at least one organosulfur compound to produce a coagitated admixture, wherein said coagitation refers to strong and thorough mixing of said organosulfur compound with said aqueous emulsifier in a manner so as to afford a significant reduction in the particle size of said organosulfur compound in said aqueous emulsifier.

4,125,482

METHOD OF PREPARING MAGNESIUM OXIDE IMPREGNATED ACTIVATED CARBON

Rabindra K. Sinha, Coraopolis, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 22, 1977, Ser. No. 779,954
Int. Cl.[2] B01J *21/18;* **C09F** *5/10*
U.S. Cl. 252—447 **2 Claims**

1. A method of preparing an activated carbon impregnated with from about 1.0 percent to about 15.0 percent by weight of magnesium oxide, comprising:
(a) admixing the activated carbon to be impregnated with an aqueous solution of a sufficient amount of a water soluble magnesium salt to result in from about 1.0% to about 15.0% by weight magnesium oxide in the final activated carbon product;
(b) drying said mixture;
(c) admixing with the dried product of the previous step an aqueous solution of a stoichiometric amount of sodium hydroxide;
(d) drying said mixture;
(e) calcining the product of the previous step at a temperature of from about 550° to about 650° F. in an inert atmosphere for from about 0.25 to about 1.0 hours;
(f) water washing the product of the previous step until the sodium ion concentration of the wash effluent is less than 1.0 part per million; and
(g) drying the product of the previous step to recover the final product.

4,125,483
DIMERIZATION PROCESS CATALYST

Roger S. Downing; Jan van Amstel, and Annie H. Joustra, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 16, 1977, Ser. No. 797,277
Int. Cl.[2] B01J *29/06, 23/02*
U.S. Cl. 252—455 R **3 Claims**

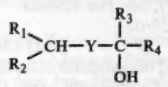
1. A catalyst composition comprising a cation-exchangeable aluminosilicate selected from the group consisting of montmorillonite clay mineral and synthetic silica-alumina having incorporated in the lattice thereof by ion exchange from about 0.1 to about 5 percent by weight, basis aluminosilicate, of copper(I) ions and from about 0.1 to about 5 percent by weight, basis aluminosilicate, of ions of cesium.

4,125,484
TERTIARY ALCOHOLS

Robin T. Gray, and Aaldert J. De Jong, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 24, 1977, Ser. No. 771,600
Claims priority, application United Kingdom, Feb. 27, 1976, 7819/76
Int. Cl.[2] A61K *7/46;* C07C *33/02, 35/02, 35/22*
U.S. Cl. 252—522 **5 Claims**

1. A tertiary alcohol compound of the formula:



in which R_1 represents a dimethylhexenyl or dimethylcyclohexenyl group; R_2 represents a hydrogen atom or a methyl group, or R_1 and R_2, together with the carbon atom to which they are linked, form a dimethylbicyclo[2,2,1]heptyl, dimethylbicyclo[3,1,1]heptyl, dimethylbicyclo[2,1,1]heptenyl or dimethylbicyclo[3,3,1]nonenyl group; R_3 and R_4 each represents a methyl group; and Y represents a methylene, propylene or propenylene group; with the proviso that when R_1 is a dimethylhexenyl group, Y is a propenylene group.

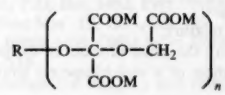
5. A perfume composition or a perfumed product comprising a tertiary alcohol of claim 1 together with an adjuvant therefor.

4,125,485
DETERGENT FORMULATION CONTAINING NOVEL ETHER CARBOXYLATES

Kent P. Lannert, Freeburg, Ill., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 670,336, Mar. 25, 1976, which is a continuation of Ser. No. 471,088, May 17, 1974, abandoned. This application Sep. 2, 1977, Ser. No. 830,273
Int. Cl.[2] C11D *3/20*
U.S. Cl. 252—546 **7 Claims**

1. A detergent formulation comprising (a) from 1% to 95% by weight of a compound corresponding to the formula

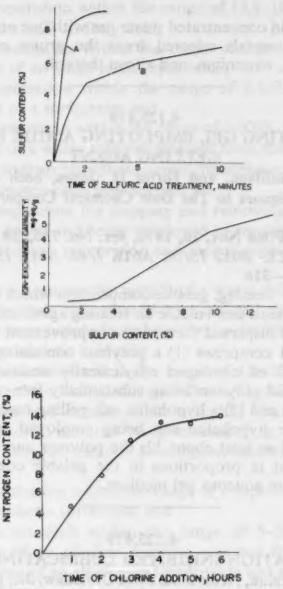


wherein M is alkali metal or ammonium and wherein n is a number from 1 through 3, and wherein R is selected from an alkyl radical having from 1 to 20 carbon atoms, an alkenyl radical having from 1 to 20 carbon atoms, an alkynyl radical having from 1 to 20 carbon atoms, a cycloalkane radical having from 3 to 20 carbon atoms, an alkanol radical having from 2 to 20 carbon atoms, an ether radical having at least 3 carbon atoms, an aryl radical having at least 6 carbon atoms, a substituted aryl radical having at least 6 carbon atoms wherein the substituents are halogen, nitro, amide or carboxyalkyl substituents, aralkyl radicals having at least 7 carbon atoms and arylether radicals having at least 7 carbon atoms, and (b) from 0.5 to 95% by weight of a surfactant selected from the group consisting of water soluble anionic, nonionic, amphoteric and zwitterionic surfactants.

4,125,486
PARTIALLY POLYENIZED POLYVINYL ALCOHOL FIBERS WITH ION-EXCHANGE CAPACITY AND PROCESS FOR THE PRODUCTION THEREOF

Mitsutaka Uzumaki, Tokyo; Masahiko Takashio, and Tadayoshi Utsumi, both of Fujieda, all of Japan, assignors to Nitivy Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1976, Ser. No. 737,132
Claims priority, application Japan, Jul. 5, 1976, 51-78873
Int. Cl.[2] C08F *116/06, 8/36;* B01D *15/04*
U.S. Cl. 521—32 **10 Claims**



1. Fibers with an cation-exchange capacity comprising a partially polyenized polyvinyl alcohol fiber having a sulfuric ester radical introduced therein by a sulfation reaction with hydroxyl groups of the remaining vinyl alcohol units, said partially polyenized polyvinyl alcohol fiber being obtained by heating and dehydrating a polyvinyl alcohol type fiber so that the dehydration weight loss falls within the range of about 5 to 25%.

4,125,487
NON-CELLULAR AND CELLULAR COMPOSITES OF POLYURETHANES AND VINYL POLYMERS

Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 23, 1977, Ser. No. 799,421
Int. Cl.[2] C08G *18/22, 18/62*
U.S. Cl. 521—137 **56 Claims**

1. A process for preparing non-cellular polyurethane/vinyl polymer composite articles having a density of at least about 1 g/cc without the application of an external source of heat which process comprises:

(I) admixing the components of a composition comprising

(A) a liquid polyol free of nitrogen atoms and substantially

free of ethylenic unsaturation or mixtures of such polyols having from about 2 to about 8 hydroxyl groups and an average OH equivalent weight of at least about 30;

(B) an organic polyisocyanate which is substantially free of ethylenic unsaturation or a mixture of such polyisocyanates having an NCO equivalent weight of less than about 1000, with the proviso that when component (A) has an average of about 2 hydroxyl groups per molecule, said polyisocyanate has an average of at least about 2.5 NCO groups per molecule;

(C) from about 15% to less than about 75% by weight of the combined weight of Components (A), (B), (C), (D) and (E) of a polymerizable ethylenically unsaturated monomer having an atmospheric boiling point above about 70° C;

(D) an effective quantity of a suitable catalyst for polymerizing component (C);

(E) an effective quantity of a suitable catalyst for urethane formation selected from the compounds of the metals cobalt, copper, vanadium, and mixtures thereof; and

(F) from 0 to about 50% by weight based upon the combined weight of Components (A), (B), (C), (D), (E) and (F) of a modifier substance free from groups reactive with components (A), (B) or (C) at the conditions employed herein, said modifier substances being selected from the group consisting of

(1) liquid substances having an atmospheric boiling point of at least about 150° C;

(2) solid substances having a surface area of less than about 0.8 m^2/gram and a particle size such that said substance will pass through a one-fourth inch square opening, is substantially free of any absorbed or occluded water and will not decompose at a temperature below the maximum exotherm temperature generated by the urethane forming reaction;

(3) polymers of one or more ethylenically unsaturated monomers, said polymers having

(a) a molecular weight such that the polymer has a grease melt index as determined with a 0.02-inch orifice employing a total weight of 2160 grams at 80° C of from about 1 to about 250 grams/minute;

(b) a solubility parameter of at least about 8; and

(c) a specific heat of at least about 0.35 calories/-gram/° C; and

(4) mixtures thereof; and wherein components (A) and (B) are present in quantities such that the NCO:OH equivalent ratio is from about 0.70:1 to about 1.5:1 and with the following provisos:

(a) that the urethane exotherm temperature does not greatly exceed the boiling point of the monomer or mixtures of monomers employed as component (C);

(b) that the combined quantity of component (C) and (F) be less than about 60% by weight based upon the combined weight of components (A), (B), (C) and (F);

(c) that when Component (F-3) is employed as component (F), it is employed in quantities of 20% by weight of the combined quantities of components (A), (B) and (F);

(II) pouring the admixed composition into a suitable mold wherein said compositions solidifies to a solid having the aforesaid density; and

(III) subsequently demolding the resultant articles from the mold.

29. Cellular polyurethane/vinyl polymer composites articles having substantially uniform cells, a density of less than 1 g/cc and which results without the application of an external source of heat after admixture of a composition which comprises

(A) a liquid polyol free of nitrogen atoms and substantially free of ethylenic unsaturation or mixture of such polyols having from about 2 to about 8 hydroxyl groups and an average OH equivalent weight of at least about 30;

(B) an organic polyisocyanate which is substantially free of ethylenic unsaturation or a mixture of such polyisocyanates having an average NCO equivalent weight of less than about 300, with the proviso that when Component (A) has an average of about 2 hydroxyl groups per molecule, said polyisocyanate has an average of at least about 2.5 NCO groups per molecule;

(C) from about 15% to less than about 75% by weight of the combined weight of Components (A), (B), (C), (D) and (E) of a polymerizable ethylenically unsaturated monomer having an atmospheric boiling point above about 70° C or a mixture of such monomers;

(D) an effective quantity of a suitable catalyst for polymerizing Component (C);

(E) an effective quantity of a suitable catalyst for urethane formation selected from the compounds of the metals cobalt, copper and vanadium; and

(F) from 0 to about 50% by weight based upon the combined weight of Components (A), (B), (C), (D), (E) or (F) of a modifier substance free from groups reactive with Components (A), (B) or (C) at the conditions employed herein, said modifier substances being selected from the group consisting of

(1) liquid substances having an atmospheric boiling point of at least about 150° C;

(2) solid substances having a surface area of less than about 0.8 m^2/gram and a particle size such that said substance will pass through a ¼-inch square opening, is substantially free of any absorbed or occluded water and will not decompose at a temperature below the maximum exotherm temperature generated by the urethane forming reaction;

(3) polymers of one or more ethylenically unsaturated monomers, said polymers having

(a) a molecular weight such that the polymer has a grease melt index as determined with a 0.02-inch orifice employing a total weight of 2160 grams/80° C of from about 1 to about 250 grams/minute;

(b) a solubility parameter of at least about 8; and

(c) a specific heat of at least about 0.35 calories/-gram/° C; and

(4) mixtures thereof; and

(G) a foam-forming system which comprises

(1) a foaming agent selected from the group consisting of

(a) low boiling vaporizable organic liquids having a boiling point below the reaction exotherm temperature;

(b) substances which decompose thermally to release CO_2 or release water vapor at the exotherm temperature;

(c) a solid particulate substance which will pass through a 2 mm square opening and which has a surface area of at least 0.8 m^2/gram;

(d) an inorganic metal hydrate characterized as having a solubility in anhydrous ethyl alcohol of less than about 1.2 grams per 100 grams and a weight loss of at least 5% when subjected to a temperature of 115° C for 30 minutes at atmospheric pressure;

(e) water; and

(f) mixtures thereof; and

(2) a cell control agent; and wherein Components (A) and (B) are present in quantities such that the NCO-:OH equivalent ratio is from about 0.7:1 to about 1.5:1; Component (G-1) is present in quantities sufficient to provide the desired density and Component (G-2) is present in quantities sufficient to provide substantially uniform cells; and with the following provisos:

(a) that the urethane exotherm temperature does not greatly exceed the boiling point of the monomer or mixture of monomers employed as Component (C);

(b) that the combined quantity of Components (C) and (F) be less than about 60% by weight based

upon the combined weight of Components (A), (B), (C) and (F);

(c) that when Component (G-1-c) or (G-1-d) is employed as the blowing agent, Component (G-2) is not required;

(d) that when Component (F-3) is employed as Component (F) it is employed in quantities to about 20% by weight based upon the combined weight of Components (A), (B) and (F).

4,125,488

FOAMED POLYESTER OF A CYCLIC DIACID ANHYDRIDE WITH AN EPOXIDE

James C. Hill, Chesterfield, and Walter R. Knox, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 646,215, Jan. 2, 1976, Pat. No. 4,094,865. This application Feb. 8, 1978, Ser. No. 875,961

Int. Cl.[2] C08J *9/06*

U.S. Cl. 521—128 **10 Claims**

1. A foamed polymeric material comprising a polyester produced by a process which comprises:

a. forming a mixture of a cyclic diacid anhydride, a poly-terminal epoxide and a mono-terminal epoxide, the ratio of total epoxy groups to cyclic diacid anhydride groups being from 1:1 to 2:1 and the epoxy-equivalent mole ratio of polyepoxide to monoepoxide being from 0.01 to 1.0, and adding to said mixture a catalytically effective quaternary salt in an amount that is from 0.0001 to 0.2 mole per mole of anhydride, and from 0.5 to 5% by weight of a blowing agent that decomposes or volatilizes under the reaction conditions of steps *b, c* and *d.*

b. initiating a non-self-sustaining exothermic reaction between the epoxide and anhydride components of the mixture,

c. raising the temperature of the mixture to a point at which the exothermic reaction becomes self-sustaining, and

d. controlling the reaction conditions during the self-sustaining exothermic reaction such that the temperature of the reaction mixture is not substantially reduced until after the rate of evolution of heat by the reaction has begun to decrease;

the time spent in stages *b* and *c* combined being less than 600 seconds.

4,125,489

NOVEL PREPOLYMERS, FLAME RETARDANT INTERPOLYMERS PREPARED THEREFROM, AND PROCESSES FOR THE PREPARATION THEREOF

Thirumurti Narayan, Riverview, and Moses Cenker, Trenton, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 745,628, Nov. 29, 1976. This application Mar. 31, 1978, Ser. No. 892,338

Int. Cl.[2] C08J *9/00*

U.S. Cl. 521—136 **28 Claims**

1. An interpolymer prepared by interpolymerizing an organic polyisocyanate with a reactive liquid prepolymer, the prepolymer comprising at least three interpolymerized monomers including (a) a hydroxy aromatic compound selected from the group consisting of phenol, resorcinol, cresol, xylenol, chlorophenol, bisphenol-A, alpha-naphthol and beta-naphthol, (b) an aldehyde containing about 1–8 carbon atoms which is interpolymerizable with the said hydroxy aromatic compound, and (c) furfuryl alcohol, the said prepolymer having a viscosity of about 100–500,000 centipoises at 25° C. and containing about 1.1–6 moles of interpolymerized aldehyde and about 3.1–15 moles of interpolymerized furfuryl alcohol for each mole of the hydroxy aromatic compound interpolymerized therewith.

4,125,490

METHOD OF FORMING DIMENSIONALLY STABLE FOAMED ARTICLES OF POLYVINYL AROMATIC RESINS AND RESULTANT PRODUCT

Siebolt Hettinga, Puckerbrush Rd., Adel, Iowa 50003

Filed Apr. 6, 1976, Ser. No. 674,072

Int. Cl.[2] B29D *27/00*

U.S. Cl. 521—51 **9 Claims**

1. A method for forming a substantially rigid, dimensionally stable, interiorally foamed, polyvinyl aromatic resin article having a substantially non-foamed outer skin, which method comprises:

preparing a foamable melt comprised of a polyvinyl aromatic resin and a blowing agent;

incorporating in the foamable melt a finely divided inert solid material, the material having been treated to render the solid surface hydrophobic;

plasticating the foamable composition and the hydrophobic surface treated solid at an elevated first temperature to prepare a homogeneous charge for injection into a mold having a mold cavity;

injecting the homogeneous charge into the mold cavity maintained at a second temperature which is lower than the first temperature and is sufficient to cause solidification of that portion of the mold charge which contacts the walls of the mold cavity to form a solid skin;

allowing the charge to expand in the old cavity so as to take on the shape of the mold cavity and then

removing the molded foamed article from the mold cavity and allowing the article to cool to room temperature.

9. A level frame having a substantially smooth, non-porous outer skin and a foamed interior formed solely of a polyvinyl aromatic resin molded by the method of claim 1 and capable of meeting tolerances in the order of ± 0.002 inches.

4,125,491

MODIFIED ISOCYANATE COMPOSITIONS

John J. Gorman, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 27, 1977, Ser. No. 801,369

Int. Cl.[2] C08L *7/00*

U.S. Cl. 260—3 **10 Claims**

1. As a composition of matter, a product of a reaction of one equivalent of tolylene diisocyanate trimerized to a degree of about 90–130% containing at least about 80% of the 2,4-isomer and at most 20% of the 2,6-isomer with about 0.02–0.25 equivalent, based on free isocyanate groups, of active hydrogen supplied either by a secondary, aliphatic monoamine containing 24–36 carbon atoms or a mixture of such amine with an aliphatic monofunctional alcohol containing 12–24 carbon atoms, the relative equivalent percent of amine based on the total equivalents of active hydrogen being within the range of about 10–100.

4,125,492

AFFINITY CHROMATOGRAPHY OF VIBRIO CHOLERAE ENTEROTOXIN-GANGLIOSIDE POLYSACCHARIDE AND THE BIOLOGICAL EFFECTS OF GANGLIOSIDE-CONTAINING SOLUBLE POLYMERS

Pedro Cuatrecasas, 10 Hillside Rd., and Indu Parikh, 4404 Keswick Rd., both of Baltimore, Md. 21210

Continuation of Ser. No. 475,313, May 31, 1974, abandoned. This application Aug. 10, 1976, Ser. No. 713,095

Int. Cl.[2] C08L *1/02, 3/02, 5/02*

U.S. Cl. 260—9 **15 Claims**

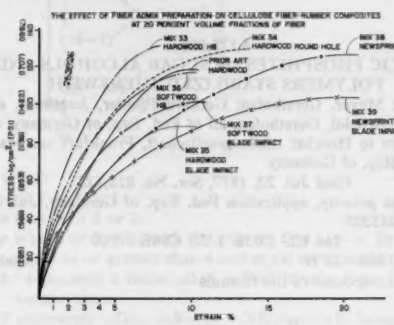
1. In a polysaccharide matrix useful as an adsorbent for affinity chromatography techniques, the improvement which comprises a ganglioside molecule covalently coupled to the backbone of said polysaccharide matrix.

4. The polysaccharide matrix as defined by claim 1, further comprising a cholera toxin adsorbed thereto.

4,125,493
FIBRATED ADMIX OR POLYMER AND PROCESS THEREFORE

Richard W. Posiviata, Lakewood, and Jonathan A. Johnston, Denver, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Apr. 1, 1977, Ser. No. 783,926
Int. Cl.[2] C08L *1/02*
U.S. Cl. 260—17.4 CL **22 Claims**


THE EFFECT OF FIBER ADMIX PREPARATION ON CELLULOSE FIBER-RUBBER COMPOSITES AT 20 PERCENT VOLUME FRACTIONS OF FIBER
MIX 33 HARDWOOD HS
MIX 34 HARDWOOD ROUND HOLE
MIX 38 NEWSPRINT HS
PRIOR ART HARDWOOD
MIX 36 SOFTWOOD HS
MIX 39 NEWSPRINT BLADE IMPACT
MIX 37 SOFTWOOD BLADE IMPACT
MIX 35 HARDWOOD BLADE IMPACT
STRAIN %

1. A process for preparing a fibrated admix which comprises prior to at least partially encasing fiber with a polymer, the steps of:

fiberizing non-regenerated cellulose to fibers having median lengths of about 0.03mm to 2.9mm;

fluffing and partially untangling the fibers;

blending carbon black particles with the fibers from about 5 parts to about 200 parts by weight of carbon black to fiber and simultaneously dusting and partitioning the fibers with the carbon black particles; and

blending oil with the fibers and carbon black from about 2:1 to about 1:2 ratio of oil by weight to carbon black.

4,125,494
ADHESION PROMOTER FOR 2-CYANOACRYLATE ADHESIVE COMPOSITIONS

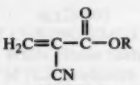
Jules E. Schoenberg, Scotch Plains, and Dilip K. Ray-Chaudhuri, Bridgewater, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Aug. 12, 1977, Ser. No. 823,981
Int. Cl.[2] C07C *121/32*; C08L *1/10*; C09K *3/00*
U.S. Cl. 260—17 A **10 Claims**

1. An improved adhesive composition comprising a mixture of:

(A) a fully stabilized 2-cyanoacrylate adhesive consisting essentially of:

(1) a monomeric ester of 2-cyanoacrylic acid of the general formula:



wherein R is an alkyl or alkenyl group having from 1 to 16 carbon atoms, a cyclohexyl group or a phenyl group, and

(2) an effective amount of an anionic polymerization inhibitor selected from the group consisting of acidic gases, protonic acids and anhydrides thereof, wherein said anionic polymerization inhibitor has a pK_a less than about 4; and

(B) an amount of acetic acid, in the range of from 0.02 to 0.3% by weight, based on the total composition, sufficient to provide said composition with a tensile shear strength of at least 80 kg./cm.^{2} as measured on brass.

4,125,495
SYNTHETIC/RESIN BASED COMPOSITIONS

Gerald J. L. Griffin, London, England, assignor to Coloroll Limited, London, England

Continuation-in-part of Ser. No. 527,038, Nov. 25, 1974, Pat. No. 4,016,117, and Ser. No. 665,418, Mar. 10, 1976, Pat. No. 4,021,388, which is a division of Ser. No. 527,038, , which is a continuation-in-part of Ser. No. 353,414, Apr. 23, 1973, abandoned. This application Mar. 7, 1977, Ser. No. 775,036
Claims priority, application United Kingdom, Feb. 18, 1977, 06987/77
The portion of the term of this patent subsequent to May 3, 1994, has been disclaimed.
Int. Cl.[2] C08L *1/00, 3/00, 5/00*
U.S. Cl. 260—17.4 ST **5 Claims**

1. A biodegradable composition including a polymer having carbon to carbon linkages and dispersed therein from more than 50% and up to 90% by weight of starch granules, the surface of said granules being modified by reaction with a compound which reacts with hydroxyl groups to form an ether or an ester.

4,125,496
FRICTION MATERIAL

Stephen B. McGinnis, Beacon Falls, Conn., assignor to Raybestos-Manhattan, Inc., Trumbull, Conn.

Filed Jan. 28, 1977, Ser. No. 763,546
Int. Cl.[2] C08K *3/08*; C08L *1/00*
U.S. Cl. 260—17.4 BB **8 Claims**

1. A friction element particularly useful in motor vehicles comprising a mixture of:

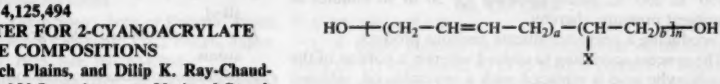
(a) from about 20 to about 70 percent asbestos fibers;

(b) from about 5 to about 25 percent cellulose fibers;

(c) up to about 15 percent coke particles;

(d) up to about 10 percent graphite particles, and

(e) up to about 15 percent carbon black, bonded together with from about 10 to about 60 percent of a thermosetting organic binder comprising a hydroxyl terminated butadiene copolymer of the formula



wherein X is phenyl or CN, *a* has a value of from 0.5 to 0.95, *b* has a value of from 0.05 to 0.5, and *n* is an integer from about 10 to 140; said binder having been cured with from about 0.1 to about 5 percent of a peroxide catalyst; all of said percentages being by weight based on the total weight of said friction element.

4,125,497
METHOD FOR MANUFACTURING HEAT-CURED MOLDED ARTICLES FROM CEMENT

Friedrich Josten; Martin Cherubim, both of Moers, and Karl-Heinz Renkes, Kamp-Lintfort, all of Fed. Rep. of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Fed. Rep. of Germany

Filed May 27, 1976, Ser. No. 690,443
Claims priority, application Fed. Rep. of Germany, May 31, 1975, 2524199
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—18 R **5 Claims**

1. A composition of matter consisting essentially of 100 parts by weight cement selected from the group consisting of portland cement, blastfurnace cement, sulfate cement and sorrel cement; 15 to 25 parts by weight acetone-formaldehyde resin in an aqueous solution consisting essentially of 30 to 60 weight percent acetonformaldehyde resin dissolved in water; and from 0.1 to 0.5 weight percent, by weight basis of total inorganic solids in said composition, of a soap selected from the group consistin of bivalent and trivalent metal salts of

saturated and unsaturated aliphatic monocarboxylic acids of 10 to 20 carbon atoms, and mixtures thereof.

4,125,498

PROCESS FOR THE PRODUCTION OF POLYESTER-SILICATE RESINOUS PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 653,727, Jan. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 562,201, Apr. 14, 1975, abandoned. This application May 9, 1977, Ser. No. 794,915

Int. Cl.[2] C08L *91/00*

U.S. Cl. 260—18 S **8 Claims**

1. The process for the production of polyester silicate resinous products by the following steps:

(a) mixing 20 parts by weight of dry granular silicic acid, 20 to 40 parts by weight of a polycarboxylic acid, selected from the group consisting of maleic acid, phthalic acid, succinic acid, oxalic acid, malonic acid, glutaric acid, adipic acid, pimelic acid, suberic acid, isophthalic acid, fumaric acid, azelaic acid, sebacic acid, terephthalic acid, itaconic acid, malic acid, diglycolic acid, tartaric acid, and mixtures thereof, 20 to 40 parts by weight of a polyhydroxyl alcohol, selected from the group consisting of ethylene glycol, propylene glycol, butylene glycol, trimethylene glycol, tetramethylene glycol, pentamethylene glycol, hexamethylene glycol, diethylene glycol, triethylene glycol, polybutylene glycol, bis(β-hydroxyethyl) terephthalate, Bisphenol A, resorcinol, 2,2'-oxydiethanol, glycerol, di and tripentaerythritol, trimethylol propane, glycerol monochlorohydrin, sorbitol, mannitol, trimethylol ethane, and mixtures thereof, and an alkali catalyst in the proportion of 1 to 10 percent by weight, amount based on the weight of polycarboxylic acid, polyhydroxyl alcohol and silicic acid, selected from the group consisting of sodium carbonate, sodium hydroxide, potassium hydroxide, and potssium carbonate;

(b) heating said mixture to a temperature between the melting and boiling temperature of said polyhydroxyl alcohol, 150° to 250° C, while agitating for 30 to 90 minutes at ambient pressure, thereby

(c) producing a polyester-silicate resinous product.

5. The process according to claim 1 wherein a portion of the polycarboxylic acid is replaced with a vegetable oil, selected from the group consisting of soya bean oil, linseed oil, cottonseed oil, tung oil, fish oil, perilla oil, oiticica oil, sunflower oil, safflower oil, walnut oil, dehydrated castor oil, monoglyceride of vegetable oils and mixtures thereof.

4,125,499

WATER-RESTRICTED, WATER-SOLUBLE PAINT

Jerald D. Howard, Upland, Calif., assignor to Pactra Industries, Inc., Los Angeles, Calif.

Filed Jun. 16, 1977, Ser. No. 807,109

Int. Cl.[2] B67B *7/00*; C09D *3/58, 3/64, 3/74*

U.S. Cl. 260—22 T **9 Claims**

1. In a pressure-tight spray can having a valved opening and containing a liquid paint composition and a volatile propellant for spraying said liquid composition through said valved opening, the improvement according to which said paint composition comprises:

from 5 to 60 weight percent of a water soluble, neutralized resin film former obtained by reaction of (a) resin containing sufficient carboxyl groups to be water solubilized by reaction with a basic neutralizer to form a salt thereof, and (b) an amine or ammonia as said basic neutralizer for forming said salt with said resin, the amount of said neutralizer reacted with said resin to water solubilize said resin being equal to at least 60% of the theoretical neutralization requirement of said resin; and

from 35 to 95 weight percent of a water-soluble solvent for said neutralized resin;

said paint composition having a maximum of 8 weight percent of water.

4,125,500

CYCLIC PHOSPHITES OF SUGAR ALCOHOLS AND POLYMERS STABILIZED THEREWITH

Norbert Mayer, Gersthofen; Gerhard Pfahler, Augsburg, and Franz Scheidl, Gersthofen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

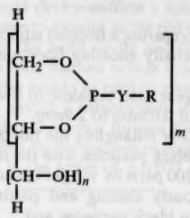
Filed Jul. 22, 1977, Ser. No. 818,123

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1976, 2633393

Int. Cl.[2] C08K *5/52*; C08B *37/00*

U.S. Cl. 260—23 H **6 Claims**

1. A compound of the formula



in which $m = 2$ or 3,

$n = 0$, 1 or 2 and $2m + n$ is equal to or lower than 6,

$Y = -O-$, $-S-$ or $-NR'-$ with $R' = H$ or C_1 to C_{20}-alkyl,

$R =$ an unbranched alkyl group, having 12 to 20 carbon atoms.

3. Moldable plastics composition consisting essentially of a member selected from the group of homopolymers and copolymers of halogen-free C_2 to C_4-alpha-olefins, chlorinated polyolefins and chlorine-containing vinyl homo- and copolymers and containing as stabilizer a compound as claimed in claim 1 in an amount of from 0.05 to 5.0 parts by weight per 100 parts by weight of polymer.

4,125,501

PHOSPHITES OF SUGAR ALCOHOLS AND POLYMERS STABILIZED THEREWITH

Harald Häberlein; Norbert Mayer, both of Gersthofen, and Gerhard Pfahler, Augsburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

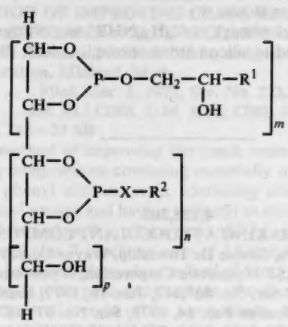
Filed Jul. 22, 1977, Ser. No. 818,139

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1976, 2633392

Int. Cl.[2] C08B *37/00*; C08K *5/52*

U.S. Cl. 260—23 H **6 Claims**

1. A compound of the formula I



(I)

in which

m is 1 or 2 or 3,

n is zero or 1 or 2,

p is zero or 1 or 2, with the proviso that $(2m + 2n + p)$ is equal to or greater than 4 and equal to or smaller than 6,

R^1 represents a linear alkyl radical having from 10 to 30 carbon atoms,

X represents —O—, —S— or —NR′— with R′ being hydrogen or C_1 to C_{20} alkyl, and

R^2 represents a linear alkyl radical having from 12 to 30 carbon atoms.

4. Moldable plastics composition consisting essentially of a member selected from the group of homopolymers and copolymers of halogen-free C_2 to C_4 alpha-olefins, chlorinated polyolefins and chlorine-containing vinyl homo- and copolymers and containing as stabilizer a compound as claimed in claim 1 in an amount of from 0.05 to 5.0 parts by weight per 100 parts by weight of polymer.

4,125,502

POLYVINYL ACETATE-MODIFIED PHENOLIC RESIN COMPOSITION

Nobutaka Nakamura, and Yukio Saeki, both of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed Dec. 29, 1975, Ser. No. 644,996

Claims priority, application Japan, Dec. 26, 1974, 50-148453

Int. Cl.[2] C08L *61/10*

U.S. Cl. 260—29.3 **7 Claims**

1. In an aqueous polyvinyl acetate-modified thermosetting resol phenolic resin adhesive composition wherein the weight ratio of polyvinyl acetate to resol resin is about 9:1 to about 1:1, the improvement wherein the composition comprises about 2 to about 20 parts per 100 parts by weight of the polyvinyl acetate modified phenolic resin solids of a lower saturated aliphatic polyhydric alcohol having 2 to 6 alcoholic hydroxy groups per molecule.

4,125,503

ULTRAVIOLET CURING EMULSION SYSTEMS

William H. McCarty, White House Station, and Carlos J. Martinez, Edison, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 12, 1976, Ser. No. 731,287

Int. Cl.[2] C08L *37/00*

U.S. Cl. 260—29.7 NR **9 Claims**

1. An ultraviolet curable aqueous emulsion coating composition consisting essentially of water having emulsified therein liquid droplets comprising ultraviolet curable water insoluble extremely viscous to solid polyethylenically unsaturated resin in solution in ethylenically unsaturated liquid monomer, the ratio of polyethylenically unsaturated resin to liquid monomer being in the range of 5:95 to 95:5, said liquid droplets containing a phenyl ketone photosensitizer and being stabilized in the emulsion by means of a polyoxypropylene-polyoxyethylene emulsifier in an amount of about 0.1% to about 15%, based on the weight of resin which it is desired to emulsify.

4,125,504

CEMENT ADDITIVES COMPRISING A POLYMER LATEX CONTAINING A STYRENE-ACRYLATE-ACRYLAMIDE INTERPOLYMER AND A BUTADIENE RUBBER

Inder Mani, and James Peters, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 27, 1977, Ser. No. 864,420

Int. Cl.[2] C08L *9/10*

U.S. Cl. 260—29.7 S **10 Claims**

1. A cement additive consisting essentially of (1) a polymer latex containing up to about 60 parts by weight of latex polymer solids, said solids consisting essentially of (A) the polymerized product of (a) from about 45 to about 65 parts by weight of a monomer selected from the group consisting of styrene, vinyl toluene and tertiary butyl styrene, (b) from about 25 to about 40 parts by weight of a monomeric alkyl acrylate or alkyl methacrylate containing from 8 to 12 carbon atoms in the alkyl group, (c) from about 0.5 to about 4 parts by weight of a monomer selected from the group consisting of acrylamide and methacrylamide, and (B) from about 1 to about 20 parts by weight of a butadiene rubber containing at least about 75 parts by weight of polymerized butadiene; and based on 100 parts by weight of said latex polymer solids (2) from about 3 to about 10 parts by weight of a nonionic surfactant, and (3) from about 0.1 to about 5 parts by weight of a polyorganosiloxane foam depressant.

4,125,505

POLYMER/POLYOLS FROM HIGH ETHYLENE OXIDE CONTENT POLYOLS

Frank E. Critchfield, South Charleston; Richard M. Gerkin, Charleston, and Leslie E. Hawker, South Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jul. 6, 1976, Ser. No. 703,022

Int. Cl.[2] C08K *5/06*

U.S. Cl. 260—33.2 R **10 Claims**

1. A liquid polymer/polyol composition consisting essentially of: (1) from about 40 to 95 weight percent of a poly(oxypropylene-oxyethylene) polyol having a hydroxyl number of from about 20 to 60, an oxyethylene cap of from about 10 to 30 weight percent and an internal oxyethylene content of from about 5 to 60 weight percent, and (2) from about 60 to about 5 weight percent of a polymer formed from an ethylenically unsaturated monomer, said polymer being in the form of particles that are stably dispersed in the polyol and said composition having been produced by polymerizing the monomer in the polyol.

4,125,506

COMPOSITION FOR FABRICATION OF MULTIPHASE PLASTICS FROM LIQUID SUSPENSION

Robert D. Lundberg, Somerville, and Henry S. Makowski, Scotch Plains, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation of Ser. No. 610,826, Sep. 5, 1975, abandoned, which is a division of Ser. No. 429,162, Dec. 28, 1973, Pat. No. 3,925,280, which is a division of Ser. No. 229,487, Feb. 25, 1972, Pat. No. 3,852,096. This application Aug. 15, 1977, Ser. No. 824,924

Int. Cl.[2] C08J *3/08, 3/18, 5/12, 5/49*

U.S. Cl. 260—30.6 R **7 Claims**

1. A composition of matter which comprises a metastable suspension of a thermoplastic composition in finely divided form, i.e. an average particle size of from about 0.1 to about 200 microns, in a nonvolatile liquid in such amounts that the solids content of the suspension is in the range of from about 15 to about 75 wt. %; said thermoplastic composition consisting

essentially of a multiphase copolymer of the A–B–A or $(A–B)_n$ type, wherein n is greater than 1 and wherein A and B are thermoplastic resinous polymer blocks having softening points substantially above room temperature with B being present in at least about 30 to about 95 wt. % total polymer, said nonvolatile liquid medium being capable of plasticizing the B block of said composition above the softening point of that block but is incapable of substantially plasticizing the A block, said suspension being irreversibly converted upon heating into a flexible gelled composition.

4,125,507

PROCESS FOR PRIMING AND COMPOSITIONS THEREFOR

Joel S. Kummins, Stone Mountain, Ga., and John C. Smith, Jr., Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 514,523, Oct. 15, 1974, Pat. No. 3,975,554. This application Nov. 19, 1975, Ser. No. 634,303

Int. Cl.[2] **C08K** *5/01, 5/06, 5/10;* **C08L** *83/00*

U.S. Cl. 260—31.4 EP **3 Claims**

1. A film-forming composition comprising a homogeneous solution of

(A) from 0.99 to 15% by weight, based on the total weight of the composition of compounds selected from the group consisting of

(1) compounds of the formula

$$(RO)_{4-a}SiZ_a,$$

(2) curable reaction products of

(a) silanes of the formula

$$(RO)_3SiC_nH_{2n}NHR'$$

and

(b) epoxy compounds soluble in (C) + (D) + (E) below, and

(3) siloxanes which are condensation and cocondensation products of (1) and (2),

(B) from 0.01 to 10% by weight, based on the total weight of the composition, of at least one light-fugitive colorant which will retain at least some of its color for at least 24 hours and will, within six weeks thereafter, become colorless, in the presence of light,

(C) from 1 to 85% by weight, based on the total weight of the composition, of a solvent of the formula

$$R'''O(\underset{\underset{Q}{|}}{CHCH_2}O)_yH,$$

(D) from 1 to 85% by weight, based on the total weight of the composition, of a hydrocarbon solvent with a boiling point from about 50° C. to 250° C., and

(E) from 1 to 85% by weight, based on the total weight of the composition, of a solvent of the formula

$$CH_3C(O\underset{\underset{Q}{|}}{CH_2CH})_yOR'''$$

where

a has a value from 0 to 1,

n has a value from 3 to 9,

y has a value from 0 to 2,

Q is hydrogen or methyl,

R is independently alkyl or alkoxyalkyl containing less than 7 carbon atoms,

R′ is hydrogen or $—C_mH_{2m}NH_2$, where m is 2, 3, or 4,

R‴ is an aliphatic hydrocarbon radical containing no more than 9 carbon atoms,

Z is alkyl, vinyl, phenyl, or $C_nH_{2n}NHR'$, any nitrogen atom being bonded to silicon atoms through at least three carbon atoms.

4,125,508

METHOD OF MAKING A FLOCCULANT COMPOSITION

Günther H. Elfers, Grosse Ile Township, Wayne County, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation of Ser. No. 807,247, Jun. 16, 1977, abandoned. This application Feb. 14, 1978, Ser. No. 877,627

Int. Cl.[2] **C08K** *5/06, 5/01;* **C08J** *3/02;* **C08F** *218/00*

U.S. Cl. 260—33.2 R **8 Claims**

1. A method of making a liquid and stable flocculant composition containing about 10 to 30 percent by weight of an active-ingredient polymer, said method comprising the steps of

polymerizing at least one water soluble ethylenically unsaturated monomeric material in the form of a water-in-oil emulsion containing water, said monomer, a hydrocarbon solvent, and a surface-active agent selected from the group consisting of sorbitan monostearate, sorbitan monooleate, and sorbitan palmitate, and used in conditions of concentration and identity of said surface-active agent, time, temperature, and agitation effective to produce particles of polymer having a maximum dimension on the order of 1 millimicron to 10 microns, whereby a reaction mixture capable of affording a stable suspension is produced,

removing substantially all of the water present by azeotropic distillation with the solvent,

adding to said reaction mixture a quantity of a glycol material having a boiling point substantially higher than that of said solvent and in an amount sufficient to yield a composition having a content of said polymer on the order of 10 to 30 percent by weight, and finally

removing the remainder of such solvent from said reaction mixture by distillation to obtain said flocculant dispersion.

4,125,509

FLAME AND HEAT RESISTANT ETHYLENE-PROPYLENE RUBBER

Joseph E. Vostovich, Bridgeport, Conn., assignor to General Electric Company, New York, N.Y.

Filed Oct. 17, 1977, Ser. No. 842,695

Int. Cl.[2] **C08K** *3/22, 3/36*

U.S. Cl. 260—33.6 AQ **8 Claims**

1. A curable ethylene-propylene rubber composition having improved resistance to flame and heat and having apt electrical and physical properties, consisting essentially of the combination in approximate parts by weight of:

Ethylene-Propylene Rubber	100
Chlorosulfonated Polyethylene	3 – 10
Zinc Oxide	15 – 30
Hydrated Alumina	35 – 100
Vinyl Silane	1 – 3
Amorphous Precipitated Silica	35 – 100
Antimony Oxide	2 – 10
Antioxidant	0.5 – 6
Peroxide Curing Agent	2 – 8
Curing Coagent	0 – 2

4,125,510

METHOD OF IMPROVING CRACK RESISTANCE OF SILOXANE MOLDING COMPOSITIONS

Robert C. Antonen, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Mar. 1, 1977, Ser. No. 773,364
Int. Cl.[2] C08K 3/34, 3/36; C08L 83/06
U.S. Cl. 260—37 SB 7 Claims

1. A method of improving the crack resistance of siloxane molding compositions consisting essentially of

(1) a phenyl siloxane resin containing silicon-bonded hydroxyl groups and having a phenyl to silicon ratio of 0.3:1 to 0.9:1 and an R to silicon ratio of 0.4:1 to 1.1:1 and a total phenyl plus R to silicon ratio of 1:1 to 1.4:1 in which R is an aliphatic hydrocarbon radical of 1 to 2 C atoms, and (3) from 70 to 85 percent by weight of a siliceous filler based on the total weight of the composition, the improvement comprising adding to the composition from 2 to 15 percent by weight, based on the combined weights of (1) and (2) of

(2) an aromatic epoxy resin having an epoxy equivalent weight of not more than 2000.

4,125,511

FILLED POLYESTER OF A CYCLIC DIACID ANHYDRIDE WITH AN EPOXIDE

James C. Hill, Chesterfield, and Walter R. Knox, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 646,215, Jan. 2, 1976, Pat. No. 4,094,865. This application Feb. 8, 1978, Ser. No. 875,960
Int. Cl.[2] C08L 67/00
U.S. Cl. 260—40 R 9 Claims

1. A polymeric material comprising a polyester produced by a process which comprises:

a. forming a mixture of a cyclic diacid anhydride, a poly-terminal epoxide and a mono-terminal epoxide, the ratio of total epoxy groups to cyclic diacid anhydride groups being from 1:1 to 2:1 and the epoxy-equivalent mole ratio of polyepoxide to monoepoxide being from 0.01 to 1.0, and adding to said mixture a catalytically effective quaternary salt in an amount that is from 0.0001 to 0.2 mole per mole of anhydride,

b. initiating a non-self-sustaining exothermic reaction between the epoxide and anhydride components of the mixture,

c. raising the temperature of the mixture to a point at which the exothermic reaction becomes self-sustaining, and

d. controlling the reaction conditions during the self-sustaining exothermic reaction such that the temperature of the reaction mixture is not substantially reduced until after the rate of evolution of heat by the reaction has begun to decrease; the time spent in stages b and c combined being less than 600 seconds and 1 to 95% by weight of an inert filler material.

4,125,512

PROCESS FOR THE PRODUCTION OF A STORABLE, SCORCH-RESISTANT RUBBER/FABRIC BONDING AGENT COMBINATION

Rüdiger Schubart, Cologne, and Klaus-Dieter Albrecht, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Jul. 26, 1977, Ser. No. 819,007
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1976, 2634034
Int. Cl.[2] C08G 8/22; C08K 3/34
U.S. Cl. 260—42.14 10 Claims

1. A mixture consisting of

(a) a resorcinol donor which substantially lowers the mixing temperature with rubber to thereby avoid sublimation and pollution difficulties,

(b) a formaldehyde donor,

(c) calcium silicate and

(d) a metal oxide of Group IIa or IIIa of the Periodic System.

4,125,513

THERMOPLASTIC COMPOSITIONS CONTAINING TRIAZINE POLYMER COATED REINFORCING AGENTS

Gordon H. Miller, Littleton, Colo., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 621,702, Oct. 14, 1975. This application Sep. 7, 1977, Ser. No. 831,215
Int. Cl.[2] C08K 9/04, 9/10
U.S. Cl. 260—42.14 4 Claims

1. A reinforced thermoplastic composition comprising a polyolefin having uniformly dispersed throughout from about 10 to about 40 weight percent based on the weight of the composition of glass fiber coated with a soluble, curable triazine polymer; the said polymer being prepared by a process which comprises:

(a) preparing a partially cured thermoplastic triazine polymer by heating an aliphatic polynitrile of the formula:

wherein *n* is an integer of from 1 to 8 inclusive and in each

unit

R and R′ are independently selected from the group consisting of hydrogen, alkyl of from 1 to 10 inclusive carbon atoms, amino, nitro, hydroxyl, carboxyl and halogen, at a temperature of about 80° to about 450° C. in the presence of a catalyst selected from the group consisting of:

(a) phosphorus pentoxide, phosphorus trichloride, phosphorus pentachloride, arsenic trichloride, or arsenic pentachloride,

(b) hydrochloric acid, hydrofluoric acid, fluosulfonic acid, chlorosulfonic acid, or

(c) halides of metals of Groups II, III, IV, V or VIII of the Periodic Table as set forth on page 125 of Mellor's Inorganic Chemistry, Revised Edition, 1967;

(B) contacting the said partially cured, thermoplastic triazine polymer with a solvent of the formula:

$$R - O - R',$$

where R and R′ are independently selected alkyl groups from 1 to 5 carbon atoms in order to extract therefrom the unreacted polynitrile;

(C) extracting the soluble, curable triazine polymer as an alcoholic solution by contacting the partially cured thermoplastic triazine polymer with a monohydric alcohol, and

(D) recovering the soluble, curable triazine polymer from said alcohol solution.

4,125,514

MANUFACTURE OF MOULDING MATERIALS

Howard G. Stabler, Irwell Vale, England, assignor to TBA Industrial Products Limited, Manchester, England

Filed Oct. 4, 1977, Ser. No. 839,385

Claims priority, application United Kingdom, Oct. 4, 1976, 41136/76

Int. Cl.[2] C08K *5/35, 7/20*

U.S. Cl. 260—42.15 **20 Claims**

1. A thermoplastic moulding material consisting essentially of:

(a) from about 35 to about 94.5 percent by weight based on the total weight of material of a synthetic thermoplastic polymer having a backbone comprising at least 50% of carbon atoms selected from the group consisting of polypropylene, polyethylene, polystyrene, styrene/acrylonitrile copolymers, ABS copolymers and mixtures thereof

(b) between about 0.01 and about 0.045 and percent by weight, based on the total weight of moulding material, of a polyimide prepolymer which is the addition reaction product consisting of a polyamine and a bis-imide of an unsaturated carboxylic acid and

(c) from about 5 to about 55 percent by weight, based on the total weight of material, of a reinforcing agent selected from the group consisting of glass fiber and mica.

4,125,515

ANTIOXIDANT COMBINATION OF ESTERS AND AMINES

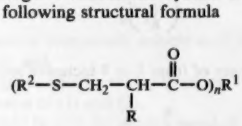
Joseph A. Kuczkowski, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 19, 1976, Ser. No. 668,567

Int. Cl.[2] C08K *5/36*

U.S. Cl. 260—45.8 NW **4 Claims**

1. A synergistic antioxidant system comprising an ester having the following structural formula

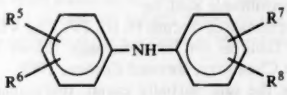


(I)

and an amine antioxidant selected from the group consisting of polymerized and non-polymerized derivatives of 2,2,4-trimethyl-1,2-dihydroquinoline, N,N'-di-substituted-p-phenylenediamines having the following structural formula

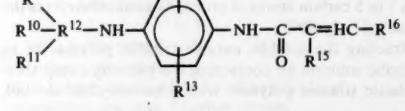
(II)

diphenyl amines having the following structural formula



(III)

and amides having the following structural formula



(IV)

wherein n is an integer from 1 to 4, wherein R is selected from the group consisting of hydrogen and methyl, wherein when n is 1, R^1 is selected from the group consisting of alkyl radicals having 1 to 18 carbon atoms, aryl radicals having 6 to 12 carbon atoms, aralkyl radicals having 7 to 12 carbon atoms and cycloalkyl radicals having 5 to 12 carbon atoms wherein when n is 2, R^1 is selected from the group consisting of alkylene radicals having 2 to 18 carbon atoms, cycloalkylene radicals having 5 to 12 carbon atoms, arylene radicals having 6 to 12 carbon atoms,

polyalkyl glycol ether radicals having the following structure

$$-CH_2-CH_2-O)_{n1}CH_2-CH_2-$$

wherein n^1 is an integer from 1 to 7, a thioether radical having the following structure

$$-CH_2-CH_2-S-CH_2-CH_2-$$

wherein when n is 3 or 4, R^1 is an aliphatic hydrocarbon radical having the formula $CyH2y+2-n$, wherein y is an integer from 3 to 6 and wherein R^2 is selected from the group consisting of alkyl radicals having 1 to 24 carbon atoms, aryl radicals having 6 to 12 carbon atoms and aralkyl radicals having 7 to 12 carbon atoms, wherein R^3 and R^4 are selected from the group consisting of alkyl radicals having 3 to 12 carbon atoms, aryl radicals having 6 to 12 carbon atoms and aralkyl radicals having 7 to 12 carbon atoms,

wherein R^5, R^6, R^7 and R^8 are selected from the group consisting of hydrogen, alkyl radicals having 1 to 20 carbon atoms and aralkyl radicals having 7 to 12 carbon atoms,

wherein R^{12} is an arylene radical having 6 to 12 carbon atoms, R^9 and R^{10} are selected from the group consisting of hydrogen, alkyl radicals having 1 to 4 carbon atoms and alkoxy radicals having 1 to 4 carbon atoms, R11 is selected from the group consisting of hydrogen, alkyl radicals having 1 to 4 carbon atoms and alkoxy radicals having 1 to 4 carbon atoms and wherein R^{13} and R^{14} are selected from the group consisting of hydrogen and alkyl radicals having 1 to 4 carbon atoms and R^{15} is selected from the group consisting of hydrogen, alkyl radicals having from 1 to 4 carbon atoms and aryl radicals having 6 to 12 carbon atoms.

2. A rubbery polymer containing the antioxidant system of claim **1** wherein the rubbery polymer is selected from the group consisting of copolymers of butadiene and styrene wherein the bound butadiene content is at least 50 percent by weight and copolymers of butadiene and acrylonitrile wherein the bound butadiene content is at least 55 percent by weight and wherein the amine antioxidant is present in the amount 0.25 to 5.0 parts and the ester is present in the amount of 1.0 to 20 parts all parts being by weight per 100 parts by weight of rubbery polymer.

4,125,516

ALKYLTHIOALKANOYLOXYALKYL AND ALKYLTHIOALKYL SUBSTITUTED BIS-HYDANTOIN COMPOUNDS

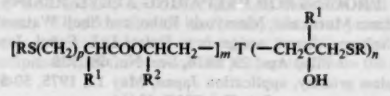
Martin Dexter, Briarcliff Manor, and David H. Steinberg, Bronx, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 668,879, Mar. 22, 1976, abandoned. This application Jan. 17, 1977, Ser. No. 759,967

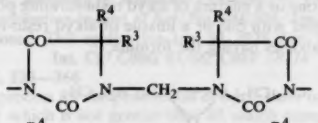
Int. Cl.[2] C07D *233/72;* **C08K** *5/34*

U.S. Cl. 260—45.8 N **8 Claims**

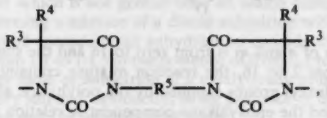
1. A compound of the formula



where m is an integer from 0 to 2 and n is an integer from 0 to 2, with the proviso that the sum of $m + n$ must be 2 when T is a radical of the structure

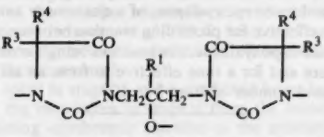


or



and

where m is an integer from 0 to 3 and n is an integer from 0 to 3, with the proviso that the sum of $m + n$ must be 3 when T is a radical of the structure



wherein

R is alkyl of 1 to 30 carbon atoms or cycloalkyl of 5 to 12 carbon atoms,

p is 0, 1 or 2,

R^1 is hydrogen or methyl,

R^2 is hydrogen, methyl or ethyl,

R^3 and R^4 are independently alkyl of 1 to 6 carbon atoms or together R^3 and R^4 are pentamethylene, and

R^5 is alkylene of 1 to 12 carbon atoms or 3-oxapentamethylene.

7. A composition of matter stabilized against deterioration which comprises a polyolefin; from about 0.005 to 5% by weight of a phenolic antioxidant; and from about 0.005 to 5% by weight of a compound according to claim 1.

4,125,517

SUBSTITUTED PIPERAZINE DIONES AND POLYMERIC COMPOSITIONS STABILIZED THEREBY

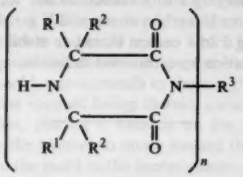
Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 633,202, Nov. 19, 1975, Pat. No. 4,051,137, which is a division of Ser. No. 391,200, Aug. 24, 1973, Pat. No. 3,928,357, which is a continuation-in-part of Ser. No. 237,982, Mar. 24, 1972, abandoned. This application Sep. 22, 1977, Ser. No. 835,759

Int. Cl.[2] C07D *241/08*

U.S. Cl. 260—45.8 N **18 Claims**

1. A composition of matter stabilized against ultraviolet deterioration which comprises a synthetic organic polymer normally subject to ultraviolet deterioration containing from 0.01% to 2% by weight of the polymer of a stabilizing compound having the formula

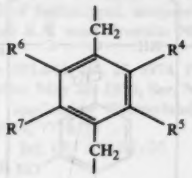


wherein

R^1 and R^2 are independently of each other methyl or ethyl or together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group;

n is an integer of from 1 to 3;

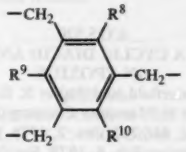
when n is 1, R^3 is alkyl of from 1 to 20 carbon atoms or a benzyl group; when n is 2, R^3 is alkylene of from 1 to 20 carbon atoms, a p-xylylene group or an alkyl substituted p-xylylene group, of the formula



wherein

R^4, R^5, R^6 and R^7 are hydrogen or lower alkyl having from 1 to 5 carbon atoms;

when n is 3, R^3 is a 1,3,5-mesitylene group or a 2,4,6-alkyl substituted mesitylene group, of the formula



wherein

R^8, R^9, and R^{10} are hydrogen or lower alkyl, having from 1 to 5 carbon atoms.

4,125,518

1-OXA-4-AZASPIRO[4,5]DECANES AS LIGHT STABILIZERS FOR POLYMERS

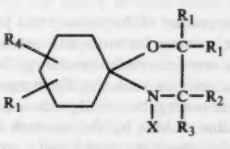
Peter V. Susi, Middlesex, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 30, 1978, Ser. No. 891,570

Int. Cl.[2] C08K *5/35*

U.S. Cl. 260—45.8 NZ **8 Claims**

1. A polymer composition containing an effective amount of a compound of the formula (I)



(I)

wherein each R_1 is selected from hydrogen and alkyl having 1

to 8 carbon atoms; R_2 and R_3 are each selected from alkyl or hydroxyalkyl having 1 to 8 carbon atoms; R_4 is hydrogen or alkyl having 1 to 18 carbon atoms and X is —H, —OH, —O·, or alkyl having 1 to 8 carbon atoms, to stabilize said polymer against degradation by ultraviolet radiation.

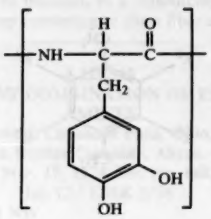
4,125,519

POLYPEPTIDES CONTAINING 3,4-DIHYDROXYPHENYLALANINE

Murray Goodman, 9760 Blackgold Rd., La Jolla, Calif. 92037; Michael S. Verlander, 407 7th St., Del Mar, Calif. 92014, and William D. Fuller, 4126 Seri, San Diego, Calif. 92117

Filed Oct. 13, 1976, Ser. No. 731,946
Int. Cl.[2] C08G *69/10*
U.S. Cl. 528—363 **8 Claims**

1. A normally solid linear polymer having as a recurring unit the structure:



said polymer having a molecular weight of at least 100,000.

4,125,520

POLYESTER OF A CYCLIC DIACID ANHYDRIDE WITH AN EPOXIDE

James C. Hill, Chesterfield, and Walter R. Knox, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 646,215, Jan. 2, 1976, Pat. No. 4,094,865. This application Feb. 8, 1978, Ser. No. 875,967
Int. Cl.[2] C08G *63/00, 59/00*
U.S. Cl. 260—830 TW **6 Claims**

1. A polymeric material comprising a polyester produced by a process which comprises:

a. forming a mixture of a cyclic diacid anhydride, a poly-terminal epoxide being the reaction product of one mole bisphenol A with two moles of epichlorohydrin, and a mono-terminal epoxide, the ratio of total epoxy groups to cyclic diacid anhydride groups being from 1:1 to 2:1 and the epoxy-equivalent mole ratio of polyepoxide to mono-epoxide being from 0.01 to 1.0, and adding to said mixture a catalytically effective quaternary salt in an amount that is from 0.0001 to 0.2 mole per mole of anhydride,

b. initiating a non-self-sustaining exothermic reaction between the epoxide and anhydride components of the mixture,

c. raising the temperature of the mixture to a point at which the exothermic reaction becomes self-sustaining, and

d. controlling the reaction conditions during the self-sustaining exothermic reaction such that the temperature of the reaction mixture is not substantially reduced until after the rate of evolution of heat by the reaction has begun to decrease; the time spent in stages b and c combined being less than 600 seconds.

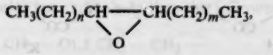
4,125,521

PROCESS FOR PREPARING ALKYD RESINS

Yasukazu Murakami; Masayoshi Kubo, and Shoji Watanabe, all of Saitama, Japan, assignors to Daicel Ltd., Sakai, Japan

Filed Apr. 29, 1976, Ser. No. 681,738
Claims priority, application Japan, May 12, 1975, 50-56975
Int. Cl.[2] C08G *63/14*
U.S. Cl. 528—274 **22 Claims**

1. A process for preparing an alkyd resin having a low acid number which comprises: mixing and reacting one or a mixture of alkyd resin-forming cyclic dicarboxylic acids, or anhydrides thereof, with one or a mixture of alkyd resin-forming polyhydric alcohols, and with one or a mixtue of alkyd resin-forming inner expoxyalkanes having the formula



wherein each of *n* and *m* is from zero to 16 and the sum of *n* plus *m* is from 2 to 16, the reaction mixture containing an excess of hydroxyl groups supplied by the polyhydric alcohol component and the epoxyalkane component in relation to the carboxyl groups supplied by the dicarboxylic acid component and the amount of the epoxyalkane component being from about 10 to about 50 percent by weight, based on the weight of the alkyd resin product, the reacting being carried out in the presence of from 0.01 to 5.0 percent by weight, based on the weight of said inner epoxyalkane, of a quaternary ammonium salt catalyst effective for promoting reaction between said acid and said inner expoxyalkane, the reaction being carried out at a temperature and for a time effective to form an alkyd resin having an acid number of from 2 to 10.

4,125,522

ADHESIVE COMPOSITION

Judith W. Becker, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 812,366, Jul. 1, 1977, abandoned. This application Jan. 26, 1978, Ser. No. 872,664
Int. Cl.[2] C08G *18/48*
U.S. Cl. 528—61 **11 Claims**

1. A curable polyurethane prepolymer made by a reaction of 1.2-2.0 moles of tolylene diisocyanate containing at least 65% of the 2,4-isomer with 1 mole of poly(tetramethyleneoxy) glycol having a number average molecular weight of about 400–3000, and a poly(ethyleneoxy) compound having a number average molecular weight of about 310–4000 and containing 7–30 ($—CH_2—CH_2O—$) groups and 1 or 2 hydroxyl groups, its ($—CH_2—CH_2O—$) groups providing 0.5–4.0% of the combined weight of the poly(ethyleneoxy) compound and poly(tetramethyleneoxy) glycol, while the poly(tetramethyleneoxy) glycol provides no less than 80% of said combined weight.

4,125,523

CATALYST FOR POLYMERIZATION OF 2-PYRROLIDONE

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 585,909, Jun. 11, 1975, abandoned. This application May 6, 1977, Ser. No. 794,446
Int. Cl.[2] C08G *69/24*
U.S. Cl. 528—312 **3 Claims**

1. A process for preparing fiber-forming polypyrrolidone which comprises contacting 2-pyrrolidone under polymerization conditions with a solid catalyst, comprising potassium pyrrolidonate and an adduct of potassium pyrrolidonate with carbon dioxide, wherein the solid catalyst is prepared by steps comprising (a) contacting metallic potassium with an equivalent or excess amount of 2-pyrrolidone to form potassium pyrrolidonate; (b) contacting the potassium pyrrolidonate, in a

non-solvent for potassium pyrrolidonate and its carbon dioxide adduct, with about 5 to 60 mol percent, based on said pyrrolidonate, of carbon dioxide to thereby obtain a precipitate comprising the solid catalyst; and (c) mechanically separating the precipitate from the non-solvent to thereby obtain the solid catalyst.

4,125,524

POLYESTER PROCESS

James C. Hill, Chesterfield, and Walter R. Knox, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 646,306, Jan. 2, 1976, abandoned. This application Jan. 30, 1978, Ser. No. 873,759

Int. Cl.[2] C08G *63/00*; C08F *18/14*

U.S. Cl. 528—366 **14 Claims**

1. A process for the production of a polyester having an acid number which is not greater than 65 which comprises:

a. forming a mixture of a diacid anhydride with a monoterminal epoxide in an anhydride to epoxide molar ratio of from 1:1 to 1:1.5 in the presence of from 0.2 to 0.0001 mole per mole of anhydride of a catalytically effective quaternary salt and, optionally, in the presence of up to 0.2 mole per mole of anhydride of water,

b. initiating a non-self-sustaining exothermic reaction between the epoxide and the anhydride,

c. raising the temperature of the mixture to a point at which the exothermic reaction becomes self-sustaining, and

d. controlling the reaction conditions such that the temperature of the reaction mixture is not reduced until a peak temperature in excess of 200° C. has been reached in the reaction mixture and substantially all available monomer has been consumed;

the time spent in stages *b* and *c* combined being less than 200 sec. and the time taken in stage *d* from the initiation of the self-sustaining exothermic reaction to the attainment of the peak temperature being also less than 200 seconds.

4,125,525

AROMATIC SULFIDE/SULFONE POLYMER PRODUCTION

Robert W. Campbell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 22, 1976, Ser. No. 698,575

Int. Cl.[2] C08F *28/00*

U.S. Cl. 528—388 **6 Claims**

1. A process for the production of high molecular weight aromatic sulfide/sulfone polymers which consists essentially of contacting:

(a) at least one dihalo aromatic sulfone,

(b) at least one alkali metal sulfide selected from the group consisting of sodium sulfide, potassium sulfide, rubidium sulfide, and cesium sulfide,

(c) at least one alkali metal carboxylate, and

(d) a sulfone diluent represented by the formula $R''SO_2R''$ wherein each R'' is a hydrocarbyl radical having from 1 to 10, inclusive, carbon atoms and the total number of carbon atoms in each molecule ranges from 2 to about 10 with the further proviso that the two R''s, together, can represent an alkylene radical having from 4 to about 12 carbon atoms in a cyclic sulfone having at least 4 carbon atoms in the heterocyclic ring, under polymerization conditions for a period of time sufficient to form an aromatic sulfide/sulfone polymer.

4,125,526

VACUUM BLANKET CURING METHOD

John E. McCready, Phoenix, Ariz., assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Jan. 2, 1973, Ser. No. 320,418

Int. Cl.[2] B29C *1/02*; B29H *3/00*

U.S. Cl. 264—90 **2 Claims**

1. The method of shaping and molding a thermoplastic or elastomeric article comprising applying a coating of the thermoplastic or elastomeric material over a mold, then applying a mold release over the material and building a vacuum cure blanket by applying sufficient liquid polyurethane reaction mixture over the mold and mold release which has at least one vacuum fitting positioned thereon to produce a blanket when cured over the mold, one-sixteenth to three-eighths inch thick having at least one vacuum fitting therein, curing said mixture to form a blanket, placing a vacuum on the fittings in the blanket to cause the blanket to move toward the mold, transferring heat from the mold to the thermoplastic or elastomeric material to raise the thermoplastic or elastomeric material to its flow and vulcanization temperature and maintaining the vacuum and temperature until the material is vulcanized, releasing the vacuum and removing the blanket to permit the molded article to be stripped from the mold.

4,125,527

PROCESS FOR THE RECOVERY OF PROTEINS

Marcel Buhler, Orbe; Hans-Ueli Bohren, La Tour-de-Peilz; Théodore Hodel, La Tour-de-Peilz, and Valentin Wenner, La Tour-de-Peilz, all of Switzerland, assignors to Societe d'Assistance Technique S.A. pour Produits Nestle, La Tour de Pieilz, Switzerland

Division of Ser. No. 491,644, Jul. 25, 1974, Pat. No. 4,018,752. This application May 27, 1975, Ser. No. 580,745

Claims priority, application Switzerland, Jul. 31, 1973, 11117/73; Jun. 7, 1974, 7779/74

Int. Cl.[2] A23J *1/20*

U.S. Cl. 260—112 R **8 Claims**

1. A process for isolating a protein fraction from whey containing the said fraction in admixture with other substances, which comprises subjecting said whey to ultrafiltration to obtain a first retentate and a permeate, diluting said retentate with a volume of whey equal to or greater than that of said permeate, subjecting the diluted retentate to at least one further ultrafiltration treatment and recovering a second retentate containing the protein fraction.

4,125,528

METHOD FOR FRACTIONATING THE WHOLE WHEAT KERNEL BY CENTRIFUGAL MEANS

Ganta V. Rao, and Floyd K. Shoup, both of Hutchinson, Kans., assignors to Far-Mar-Co, Inc., Hutchinson, Kans.

Filed Sep. 9, 1977, Ser. No. 831,973

Int. Cl.[2] A23J *1/12*

U.S. Cl. 260—112 G **17 Claims**

1. A process for fractionating the whole wheat kernel to separate at least starch and gluten and to recover at least vital wheat gluten therefrom, comprising the steps of:

a. tempering whole wheat kernels in water to a moisture content, by weight, in the range from 14% to saturation;

b. milling the tempered kernels to particulate form;

c. admixing said kernel particles with water and agitating said mixture to form a substantially homogeneous slurry in which said starch and gluten particles are dispersed, said slurry having a wheat to water ratio, by weight, of 1 part wheat to 3 or more parts water;

d. subjecting said slurry to centrifugal forces sufficient to cause said slurry to separate into a primarily starch-containing phase, a supernatant, primarily gluten-containing phase and a primarily water phase, said gluten-containing phase containing agglomerated gluten;

e. separating said supernatant agglomerated gluten-containing phase from said other phases; and

f. recovering vital wheat gluten from said agglomerated gluten-containing phase.

4,125,529

4-ACETOXY-1,2,3,4-TETRAHYDRO-2,2-DIMETHYL-6,7-METHYLENEDIOXYISOQUINOLINIUM IODIDE

Thomas J. Schwan, and Marvin M. Goldenberg, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Aug. 19, 1977, Ser. No. 826,161
Int. Cl.[2] C07D *217/10*
U.S. Cl. 546—90 **1 Claim**

1. The compound 4-acetoxy-1,2,3,4-tetrahydro-2,2-dimethyl-6,7-methylenedioxyisoquinolinium iodide.

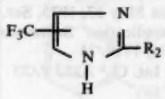
4,125,530

TRIFLUOROMETHYLIMIDAZOLES AND A METHOD FOR THEIR PREPARATION

John J. Baldwin, Lansdale, and Frederick C. Novello, Berwyn, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 610,903, Sep. 5, 1975, abandoned, and a continuation-in-part of Ser. No. 455,709, Mar. 28, 1974, abandoned, which is a division of Ser. No. 265,016, Jun. 21, 1972, Pat. No. 3,818,014, which is a continuation-in-part of Ser. No. 885,362, Dec. 15, 1969, abandoned. This application Feb. 2, 1977, Ser. No. 764,796
Int. Cl.[2] C07D *231/12, 401/04*
U.S. Cl. 546—167 **6 Claims**

1. A process for preparing a compound of the formula:



wherein R_2 is
hydrogen,
methyl,
C_3-C_5 alkyl,
2-dimethylaminoethyl,
1-dimethylamino-2-methyl-2-propyl,
pyridyl,
pyridyl-N-oxide,
monomethylpyridyl,
dimethylpyridyl,
6-quinolyl,
2-quinolyl,
3-quinolyl,
4-quinolyl,
pyrazinyl,
methoxypyrazinyl,
4-chlorophenyl-4-pyrazolyl,
4-thiazolyl,
phenyl,
o-cyanophenyl,
p-ethylphenyl,
p-sulfamoylphenyl,
p-N-methylsulfamoylphenyl,
p-methoxyphenyl,
3-furyl,
2-thienyl,
o-methoxyphenyl,
p-acetylaminophenyl,
p-cyanophenyl,
p-dimethylaminophenyl,
5-indanyl,
1-indanyl,
3,4-dichlorophenyl,
p-carboxyphenyl,
2-indanyl,
2-naphthyl,
1-naphthyl,
monohalophenyl,
p-methylsulfonamidophenyl,
p-diethylaminoethoxyphenyl,
diphenylmethyl,
1-methyl-4-pyrazolyl,
p-nitrophenyl,
2-aminophenyl,
2-furyl,
2,4-dichlorophenyl,
p-carboxyphenyl,
monomethylphenyl,
3,4-methylenedioxyphenyl,
p-isopropylphenyl,
3,4-dimethoxyphenyl,
p-N,N-dimethylsulfamoylphenyl,
p-methylaminophenyl,
2,6-dimethyl-4-pyridyl,
4,6-dimethyl-2-pyridyl,
pyrazinyl,
m-methoxymethoxyphenyl,
p-diethylaminoethoxyphenyl,
1-benzyl-4-pyrazolyl,
1-phenyl-4-pyrazolyl,
1-methyl-4-pyrazolyl, and
1-piperidino-2-methyl-2-propyl

which comprises the steps of
(a) treating 1,1-dihalo-3,3,3-trifluroacetone with a base and then
(b) treating the resulting mixture with ammonia and the appropriate carboxaldehyde.

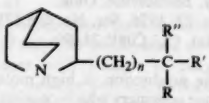
4,125,531

2-SUBSTITUTED-1-AZABICYCLO[2.2.2]OCTANES

Chung H. Yen, Skokie, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Apr. 18, 1977, Ser. No. 788,189
Int. Cl.[2] C07D *453/02*
U.S. Cl. 546—133 **15 Claims**

1. A compound of the formula



(I)

and pharmaceutically acceptable acid addition salts thereof wherein R and R′ are independently selected from the group consisting of phenyl, pyridyl, monosubstituted halophenyl, monosubstituted alkylphenyl wherein the alkyl radical contains 1 to 4 carbon atoms; R″ is selected from the group consisting of an alkyl radical containing 1 to 8 carbon atoms, alkenyl radical containing 3 to 6 carbon atoms, cycloalkyl alkyl radical wherein the first alkyl contains 3 to 6 carbon atoms and the second alkyl contains 1 to 3 carbon atoms, and cycloalkenyl radical containing 4 to 7 carbon atoms and *n* is a positive integer of 1 to 3.

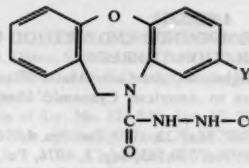
4,125,532

1-[5-(2-AZABICYCLO[2.2.2]OCT-2-YLPENTANOYL]-2-(DIBENZ-OXAZEPINE-10-CARBONYL)HYDRAZINES

Richard A. Mueller, Northbrook, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 646,686, Jan. 5, 1976, Pat. No. 4,045,442. This application Jul. 5, 1977, Ser. No. 812,552
Int. Cl.[2] C07D *413/12*
U.S. Cl. 260—244.4 **2 Claims**

1. A compound of the



wherein Y represents hydrogen, halogen, trifluoromethyl and R′ and R″ together with N represents an azabicyclic ring wherein the azabicyclic ring is 2-azabicyclo[2.2.2]oct-2-yl.

4,125,533

PIPERIDINE DERIVATIVES

Keisuke Murayama; Syoji Morimura; Takao Yoshioka; Toshimasa Toda; Eiko Mori; Hideo Horiuchi; Susumu Higashida; Katsuaki Matsui; Tomoyuki Kurumada; Noriyuki Ohta, and Hisayou Osawa, all of Tokyo, Japan, assignors to Sankyo Co. Ltd., Tokyo, Japan

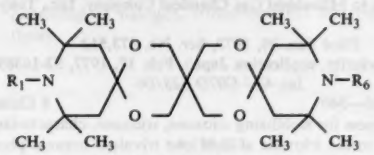
Division of Ser. No. 553,087, Feb. 26, 1975, Pat. No. 4,016,168, which is a division of Ser. No. 405,570, Oct. 11, 1973, Pat. No. 3,899,464. This application Dec. 23, 1976, Ser. No. 753,691

Claims priority, application Japan, Oct. 26, 1972, 47-107408

Int. Cl.[2] C07D *405/14*

U.S. Cl. 546—19 **4 Claims**

1. A compound having the formula



(III)

wherein

R_1 and R_6 are the same or different and each of which represents hydrogen atom,

an alkyl group having 1 to 8 carbon atoms,

a substituted alkyl group having 1 to 3 carbon atoms it its alkyl selected from the group consisting of

a hydroxyalkyl,

an alkoxyalkyl having 1 to 4 carbon atoms in its alkoxy portion,

an alkanoyloxyalkyl having 2 to 18 carbon atoms in the alkanoyl moiety,

an alkenoyloxyalkyl having 3 or 4 carbon atoms in the alkenoyl moiety,

a benzoyloxyalkyl,

a cyanoalkyl,

a halogenoalkyl,

an epoxyalkyl or

an alkoxycarbonylalkyl having 1 to 4 carbon atoms in its alkoxy portion,

an alkenyl group having 3 to 4 carbon atoms,

an alkylnyl group having 3 to 4 carbon atoms,

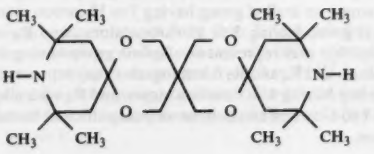
a benzyl group,

a benzyl group substituted with a halogen or methyl,

an alkoxycarbonyl group having 2 to 5 carbon atoms, or

a benzoyloxycarbonyl group.

4. A compound having the formula



(III).

4,125,534

CARBAZOLYL DIACETYLENIC COMPOUNDS

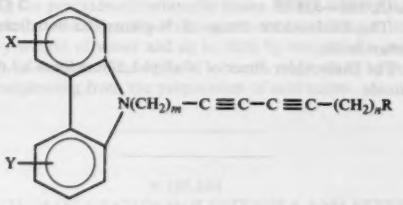
Kwok C. Yee, Randolph, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Feb. 25, 1977, Ser. No. 772,190

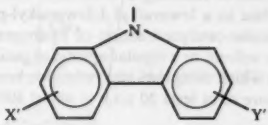
Int. Cl.[2] C07D *209/86, 209/88*

U.S. Cl. 260—315 **10 Claims**

1. A carbazolyl diacetylene having the formula



where "*m*"and "*n*"are integers of from 0 to 10, X and Y are independently selected from the group consisting of —H, —Cl, —Br and —NO and R is a member selected from the group consisting of $—CH_3$, —OH, —OCONR′ and



where R′ is (a) an alkyl derivative represented by $—C_rH_{2r+1}$, where "*r*"ranges from 1 to 18, (b) an aryl derivative of $—C_6H_5$, $—C_6H_4—p—CH_3$, $—C_6H_4$ —m—CH_3 or $—C_{10}H_7$ or (c) an ester derivative of $—CH_2OCOC_sH_{2s+1}$, where "*s*"ranges from 2 to 4 and X′ and Y′ are independently selected from the group consisting of —H, —Cl, —Br and —NO.

4,125,535

PROCESS FOR PREPARING BISIMIDES AND BISIMIDES PREPARED THEREBY

Lionel T. Wolford, Freehold, N.J., assignor to Cities Service Company, Tulsa, Okla.

Division of Ser. No. 693,027, Jun. 4, 1976, abandoned. This application Feb. 7, 1977, Ser. No. 766,098

Int. Cl.[2] C07D *209/34*

U.S. Cl. 260—326 N **12 Claims**

1. A process for preparing an N,N′-alkylene-bis-tetrabromophthalimide which comprises reacting about two molar proportions of tetrabromophthalic anhydride with about one molar proportion of a diaminoalkane containing 2–6 carbon atoms in a solvent mixture having a boiling point of at least about 125° C. and comprising about 50–97.5% by weight of a liquid aromatic hydrocarbon or halohydrocarbon having a boiling point of at least about 80° C. and about 50–2.5% by weight of an alkanoic or aralkanoic acid having a dissociation constant not higher than about 6×10^{-5} at 25° C.

4,125,536

PYROLYSIS PRODUCT OF N-SUBSTITUTED-1-CYCLOHEXENE-1,2-DICARBOXIMIDES

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 603,221, Aug. 8, 1975, Pat. No. 4,056,542, which is a division of Ser. No. 360,962, May 16, 1973, Pat. No. 3,932,457. This application May 31, 1977, Ser. No. 802,168

Int. Cl.[2] C07D *487/10, 487/04*

U.S. Cl. 260—326 C **3 Claims**

1. The Diels-Alder dimer of N-phenyl-1,3-butadiene-2,3-dicarboximide.

2. The Diels-Alder dimer of N-alkyl-1,3-butadiene-2,3-dicarboximide.

4,125,537

PREPARATION OF PYRROLE-2-ACETATES

Richard J. Carmosin, Philadelphia, Pa., assignor to McNeil Laboratories, Incorporated, Ft. Washington, Pa.

Filed Feb. 7, 1977, Ser. No. 766,305

Int. Cl.[2] C07D *207/32*

U.S. Cl. 260—326.2 **4 Claims**

1. In a method of reducing a loweralkyl 1-loweralkyl-pyrrole-2-glyoxylate to a loweralkyl 1-loweralkyl-pyrrole-2-acetate by the amine-catalyzed action of hydrogen sulfide in a tertiary amine solvent or a dipolar aprotic organic solvent, the improvement which comprises said reduction being conducted under a pressure of at least 30 p.s.i. to about 1000 p.s.i.

4,125,538

SUBSTITUTED 5-PHENYL-2,3,4,5-TETRAHYDRO-1,4-BENZOXAZEPINES

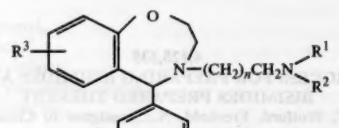
Robert T. Standridge, Cazenovia, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

Filed Feb. 4, 1977, Ser. No. 765,513

Int. Cl.[2] C07D *413/06;* A61K *31/55;* C07D *267/14*

U.S. Cl. 260—326.5 CA **14 Claims**

1. A compound having the formula



wherein

R^1 and R^2 each represent methyl or, when taken together with the nitrogen to which they are attached, represent pyrrolidino,

R^3 and R^4 are the same or different and represent hydrogen, chloro, fluoro, bromo, iodo, nitro (lower)alkyl, trifluoromethyl, (lower)alkoxy, trifluoromethoxy or (lower)alkylthio, and

n is an integer from 1 to 4,

or a nontoxic, pharmaceutically acceptable acid addition salt thereof.

4,125,539

1,3-DITHIOLANE COMPOUNDS AND METHOD OF PREPARATION THEREOF

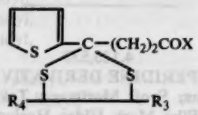
William H. Gastrock, Highstown, and Goro Asato, Titusville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 799,887, May 23, 1977, Pat. No. 4,096,155, which is a division of Ser. No. 720,163, Sep. 2, 1976, Pat. No. 4,075,228. This application Nov. 30, 1977, Ser. No. 856,151

Int. Cl.[2] C07D *333/24;* A01N *9/00*

U.S. Cl. 260—332.2 A **4 Claims**

1. A 1,3-dithiolane compound of the formula:



where R_3 and R_4 are each hydrogen or methyl, and X is chlorine or bromine.

4,125,540

PROCESS FOR STABILIZING TRIOXANE

Akitoshi Sugio, Ohmiya; Mutsuhiko Takeda, Matsudo; Makoto Mizutani, and Takeo Suzumori, both of Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jan. 30, 1978, Ser. No. 873,512

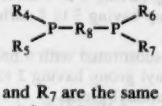
Claims priority, application Japan, Feb. 17, 1977, 52-16389

Int. Cl.[2] C07D *323/06*

U.S. Cl. 260—340 **8 Claims**

1. A process for stabilizing trioxane, trioxane, characterized by adding to the trioxane at least one trivalent organic phosphorus compound selected from the group consisting of (a) compounds corresponding to the formula

wherein R_1, R_2 and R_3 are the same or different and are independently selected from the group consisting of an alkyl group having 1 to 18 carbon atoms, an aryl group having 6 to 18 carbon atoms, an aralkyl group having 7 to 18 carbon atoms, a cycloalkyl group having 3 to 18 carbon atoms, an alkoxy group having 1 to 18 carbon atoms, an aryloxy group having 6 to 18 carbon atoms, a cycloalkyloxy group having 3 to 18 carbon atoms, and an aralkyloxy group having 7 to 18 carbon atoms, or two of three R groups taken together represent an alkylene group having 4 to 6 carbon atoms, and (b) compounds corresponding to the formula



wherein R_4, R_5, R_6 and R_7 are the same or different, and are independently selected from the group consisting of an alkyl group having 1 to 18 carbon atoms, an aryl group having 6 to 18 carbon atoms, an aralkyl group having 7 to 18 carbon atoms, a cycloalkyl group having 3 to 18 carbon atoms, and R_4 and R_5 taken together may represent an alkylene group having 4 to 6 carbon atoms and R_6 and R_7 taken together may represent an alkylene group having 4 to 6 carbon atoms, and R_8 is an alkylene group 1 to 6 carbon atoms in an amount sufficient to stabilize trioxane.

4,125,541
ARYL SUBSTITUTED KETONES

Guy D. Diana, Stephentown, and William B. Hinshaw, Jr., Sand Lake, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 324,540, Jan. 17, 1973, Pat. No. 3,878,200. This application Aug. 29, 1974, Ser. No. 501,769
Int. Cl.[2] C07C *49/76;* C07D *317/54*
U.S. Cl. 260—340.5 R 3 Claims

1. A compound of the formula

$$R''COCH_2CH_2CH_2—Y—Ar$$

wherein
is selected from the group consisting of

and ;

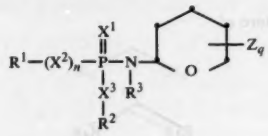
R″ is lower-alkyl of 1 to 4 carbon atoms;
R is hydrogen or lower-alkyl of 1 to 4 carbon atoms; and
Ar is phenyl substituted by 3,4-methylenedioxy or one or two monovalent substituents selected from the group consisting of halogen, trifluoromethyl and trifluoromethoxy.

4,125,542
N-TETRAHYDROPYRANYL SUBSTITUTED PHOSPHORAMIDATES AND PHOSPHONAMIDATES

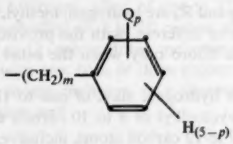
Leonard J. Stach, Riverside, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed May 19, 1977, Ser. No. 798,281
Int. Cl.[2] C07D *309/02, 309/06;* A61K *31/35*
U.S. Cl. 260—345.1 9 Claims

1. A compound of the formula



wherein X^1, X^2 and X^3 are each selected from the group consisting of oxygen or sulfur; *n* is 1; R^1 is selected from the group consisting of alkyl and



wherein *m* is an integer from 0 to 3; Q is selected from the group consisting of alkyl, alkoxy, alkylthio, alkenyl, halogen and nitro; and *p* is an integer from 0 to 5; R^2 is alkyl; R^3 is selected from the group consisting of hydrogen and alkyl; Z is selected from the group consisting of alkyl and alkoxy; and *q is the integer* 0 or 1.

4,125,543
PROCESS FOR PREPARING EPOXIDES

André Lecloux; Michel Köhler, and Paul Dantinne, all of Brussels, Belgium, assignors to Interox, Brussels, Belgium

Filed Dec. 27, 1976, Ser. No. 754,318
Claims priority, application Luxembourg, Jan. 9, 1976, 74148
Int. Cl.[2] C07D *301/14*
U.S. Cl. 260—348.25 16 Claims

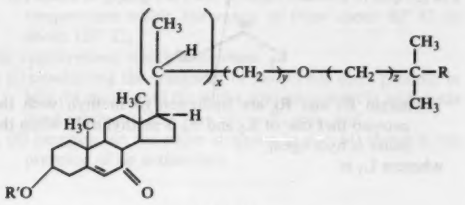
1. In the preparation of epoxides by reaction of olefins with peroxidised carboxylic resins, the improvement comprising washing the peroxidised carboxylic resins, before said contacting with the olefins, with a washing solvent containing at least 40% by weight of water and up to 60% by weight of a polar solvent, in order to eliminate the solvents, reagents or by-products originating from the preparation of said resins.

4,125,544
20/22/23/24-OXA-7-OXOCHOLESTEROLS AND ESTERS THEREOF

John H. Dygos, Northbrook, Ill., assignor to G. D. Searle, Chicago, Ill.

Filed Jun. 9, 1977, Ser. No. 804,951
Int. Cl.[2] C07J *1/00*
U.S. Cl. 260—397.4 10 Claims

1. A compound of the formula



wherein R represents hydrogen or methyl; R′ represents hydrogen or 1-oxoalkyl of fewer than 9 carbons; *x* represents 0 or 1; *y* represents 0, 1, or 2; *z* represents 0, 1, 2, or 3; the sum of the integers represented by *x, y,* and *z* is 3; and *x* represents 0 only when *y* represents 0.

4,125,545
STABILIZED DIPHENYLMETHANE DIISOCYANATE PREPOLYMER

Thaddeus F. Kroplinski, Bound Brook, and Melvin Brauer, East Brunswick, both of N.J., assignors to N L Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 706,528, Jul. 19, 1976, abandoned. This application Sep. 26, 1977, Ser. No. 836,834
Int. Cl.[2] C09F *7/06;* C07C *118/00;* C08L *91/00*
U.S. Cl. 260—404.5 18 Claims

1. A prepolymer stable at temperatures below 40° F. comprising the product of the simultaneous reaction of a polyol, 4,4,'diphenylmethane diisocyanate, and a second diisocyanate selected from the group consisting of aliphatic diisocyanate, cycloaliphatic diisocyanate and mixtures thereof, said polyol selected from the group consisting of castor oil and polyoxypropylene glycol, said polyol present in amount from about 10% to about 40%, said 4,4'diphenylmethane diisocyanate present in amount from about 50% to about 70% and said second diisocyanate present in amount from about 10% to about 20%, all of the percentages expressed on a weight basis, the reaction being carried out at a NCO/OH ratio from about 3 to about 7.

4,125,546

12,13(E)-DIDEHYDRO-13,14-DIHYDRO-9,10-DIDEHYDRO-9-DEOXY-PGD$_2$ COMPOUNDS

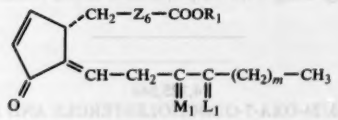
David C. Peterson, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 614,244, Sep. 17, 1975, Ser. No. 809,248, Jun. 23, 1979, Pat. No. 4,099,014, which is a division of Ser. No. 614,244, Jun. 23, 1977. This application Jun. 23, 1977, Ser. No. 809,349

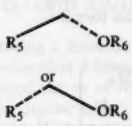
Int. Cl.[2] C07C *177/00*

U.S. Cl. 260—408 25 Claims

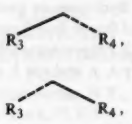
1. A prostaglandin analog of the formula



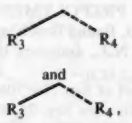
wherein *m* is one to 5, inclusive;
wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation; and
wherein Z_6 is
(1) cis-CH=CH—CH_2—$(CH_2)_g$—CF_2— or
(2) cis-CH=CH_2—CH_2—$(CH_2)_g$—CH_2—,
wherein *g* is one, 2, or 3.

4,125,547

12,13(E)-DIDEHYDRO-13,14-DIHYDRO-9-DEOXY-PGD$_1$ COMPOUNDS

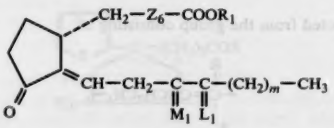
David C. Peterson, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 614,244, Sep. 17, 1975. This application Jun. 23, 1977, Ser. No. 809,264

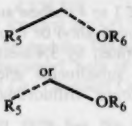
Int. Cl.[2] C07C *177/00*

U.S. Cl. 260—408 25 Claims

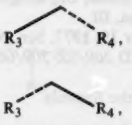
1. A prostaglandin analog of the formula



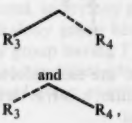
wherein *m* is one to 5, inclusive;
wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation; and
wherein Z_6 is
(1) —$(CH_2)_3$—$(CH_2)_g$—CF_2— or
(2) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
wherein *g* is one, 2, or 3.

4,125,548

12,13(E)-DIDEHYDRO-13,14-DIHYDRO-9,10-DIDEHYDRO-9-DEOXY-PGD$_1$ COMPOUNDS

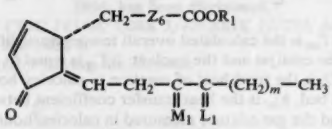
David C. Peterson, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 614,244, Sep. 17, 1975. This application Jun. 23, 1977, Ser. No. 809,350

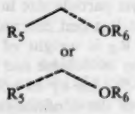
Int. Cl.[2] C07C *177/00*

U.S. Cl. 260—408 25 Claims

1. A prostaglandin analog of the formula

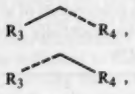


wherein m is one to 5, inclusive; wherein M_1 is

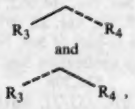


wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;

wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation; and

wherein Z_6 is

$$-(CH_2)_3-(CH_2)_g-CF_2- \quad (1)$$

or

$$-(CH_2)_3-(CH_2)_g-CH_2-, \quad (2)$$

wherein g is one, 2, or 3.

4,125,549

PROCESS FOR THE MANUFACTURE OF COSMETIC QUALITY ISOOCTYL NEODECANOATE

Myron Coopersmith, Livingston, N.J., and Leo Z. Jasion, deceased, late of Roselle, N.J. (by Florence F. Jasion, Administratrix), assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation of Ser. No. 685,346, May 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 614,787, Sep. 19, 1975, abandoned, which is a continuation of Ser. No. 359,422, May 11, 1973, abandoned. This application Sep. 19, 1977, Ser. No. 834,770

Int. Cl.[2] C11B *3/06;* A61K *7/025*

U.S. Cl. 260—425 13 Claims

1. In a process for the manufacture of cosmetic quality isooctyl neodecanoate by:

(a) contacting isooctyl alcohol with neodecanoic acid in the presence of a catalyst selected from the group consisting of sulfuric acid and p-toluenesulphonic acid at a temperature within the range of from about 160° C. to about 230° C. to form a crude ester product;

(b) treating said crude ester product formed in step (a) with a basic material at a temperature within the range of from about 50° C. to about 150° C.;

(c) distilling the ester product treated in step (b) at a temperature within the range of from about 150° C. to about 185° C. and at a pressure within the range of from about 1 to about 20 mm Hg; and, thereafter,

(d) steam stripping the ester product distilled in step (c) at a temperature within the range of from about 50° C. to about 120° C.,

the improvement which comprises:

(i) conducting the treatment of said crude ester product in step (b) above until the sulfur content present in said crude ester product is less than about 20 ppm; and

(ii) carrying out the steam stripping in step (d) above in the presence of an antioxidant.

4,125,550

REMOVAL OF FREE FATTY ACIDS FROM WATER IMMISCIBLE FLUIDS VIA ION EXCHANGE RESINS

Karl A. Schoenenberger, Geroldswil, Switzerland, and William Fries, Southampton, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Sep. 30, 1976, Ser. No. 728,107

Int. Cl.[2] C09F *5/10;* C11B *3/00*

U.S. Cl. 260—428 10 Claims

1. Method for removing free organic acids from a non-aqueous, water immiscible liquid which comprises:

(1) bringing said fluid into contact with particles of a water-solvated, macroreticular, strong-base, quaternary anion-exchange resin in its hydroxyl form;

(2) adsorbing said acids onto said resin;

(3) separating said fluid from said resin; and

(4) regenerating said resin to its original form using aqueous regenerants.

2. Method according to claim 1 wherein the water-immiscible liquid is a glyceride oil and the free organic acids are free fatty acids.

4,125,551

PROCESS FOR PRODUCING SILYLPHOSPHATES

Louis P. Petersen, Latham, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Feb. 13, 1978, Ser. No. 877,053

Int. Cl.[2] C07F *7/08*

U.S. Cl. 260—448.2 E 18 Claims

1. An improved process for producing silyl phosphates comprising reacting (1) from 1 to 30 parts by weight of phosphoric acid with (2) 100 parts by weight of a polysiloxane of the formula,

where R is a monovalent hydrocarbon radical and *w* varies from 1 to 100, in the presence of (3) from 1.2 to 180% by weight of the total composition of a silyl phosphate catalyst in which the phosphoric acid equivalency in the reaction mixture is from 0.36 to 1.80%.

4,125,552

PREPARATION OF ALKYL POLYSULFIDES

John L. Speier, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Dec. 29, 1975, Ser. No. 644,482
Int. Cl.[2] C07F *7/08, 7/18*
U.S. Cl. 260—448.8 R **5 Claims**

1. A method of producing sulfides containing the linkage CS_xC which comprises reacting (A) a halide of the formula RX_a with (B) a mixture of (1) ammonia or a hydrocarbyl amine containing one nitrogen atom, no more than 6 carbon atoms and having a K_a of less than 1×10^{-9} in aqueous solution, (2) H_2S and (3) sulfur in amount of at least two moles of (A) per mole of (2) and at least one mole of sulfur per mole of (2), at a temperature of from 0° to 175° C. under autogenous pressure whereby a compound of the formula RS_xR or $(—RS_x—)_c$ is formed in which process

R is of the group consisting of aliphatic, cycloaliphatic or aralkyl hydrocarbon radicals free of aliphatic unsaturation, such hydrocarbon radicals substituted with alkoxy, keto, carboxy, hydroxy, —$COOR^3$ or —$OOCR^3$ radicals in which R^3 is a monovalent hydrocarbon radical free of aliphatic unsaturation and silylated hydrocarbon radicals of the formula

$$(R''O)_yR'''_{3-y}SiR^4— \text{ and } O_{\frac{3-d}{2}}\ R'''_dSiR^4—$$

in which

R'' is an alkyl or alkoxyalkyl radical of 1 to 6 carbon atoms,

R''' is a monovalent hydrocarbon radical free of aliphatic unsaturation, a haloaryl radical or $R_fCH_2CH_2$— in which R_f is a perfluoroalkyl radical,

R^4 is a divalent or trivalent aliphatic, cycloaliphatic or aralkyl hydrocarbon radical free of aliphatic unsaturation,

y is 1 to 3,

d is 0 to 2,

X is bromine or chlorine,

x is 2 to 6,

a is 1 to 2, and

c is an integer of at least 2.

4,125,553

PROCESS FOR MAKING OXYGENATED CARBON COMPOUNDS

Jean B. Cropley, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 590,718, Jun. 26, 1975, abandoned. This application Dec. 8, 1976, Ser. No. 748,766
Int. Cl.[2] C07C *27/06*
U.S. Cl. 260—449 R **1 Claim**

1. The continuous process of making oxygenated carbon compounds containing two carbon atoms such as acetic acid, ethanol and acetaldehyde, by the exothermic reaction under controlled temperature conditions in a confined reaction zone, of a carbon monoxide and hydrogen gas mixture flowing about a fixed bed of solid catalyst particles of rhodium combined with a particulate substrate; controlling the temperature in the reaction zone by either direct or indirect heat transfer cooling; said particles of the bed have a number average particle size of about 0.01 microns to about 1.27 cm.; maintaining the temperature in the reaction zone from about 200° C. to about 450° C. and the pressure in the reaction zone from about 100 psia to about 10,000 psia wherein the selectivity to two carbon atom compounds exceeds 50 percent, and at least 50 weight percent of the two carbon atom compounds produced are acetic acid, ethanol and/or acetaldehyde; the temperature difference between the catalyst and the heat transfer coolant is defined by the equation:

$$\Delta T_{oa} = \Delta T_{cg}\left[1 + [M(1-e)\frac{d_t}{d_p}][1 + \frac{h_{gw}\theta}{k} + \frac{h_{gw}}{h_{wc}}]\right]$$

wherein ΔT_{oa} is the calculated overall temperature differential between the catalyst and the coolant; ΔT_{cg} is equal to $Q_r/h_{loc}a$ in which Q_r is the total heat of reaction in calories/hour/cm.[3] of catalyst bed, h_{loc} is the heat transfer coefficient between the catalyst and the gas mixture measured in calories/hour/cm.[2]/° C.; *a* is the square cm. of external surface of the catalyst per cu. cm. catalyst bed; M is 0 when the temperature is controlled by direct cooling and 1.5 when the temperature is controlled by indirect cooling; d_t is the diameter in cm. of the cross section of the reaction zone determined normal to the flow of said gas mixture; d_p is the catalyst particle size in metric units; *e* is the void fraction of the catalyst bed determined by the equation $1-(R_B/R_P)$ in which R_B is weight of catalyst particles in reaction zone divided by its volume and R_p is the weight of a single catalyst particle divided by its volume; h_{gw} is equal to h_{loc}; θ is the thickness of the confinement about the reaction zone, *k* is the thermal conductivity of said confinement determined in calories per hour-cm.-° C.; h_{wc} is heat transfer coefficient between the confinement and the coolant for direct cooling; and maintaining ΔT_{oa} at or less than $T/[C(1-CONV)]$ wherein T is the temperature of the reaction zone in ° K., C is a number between about 7 to about 40 and CONV is the fractional conversion of the gas mixture to any other product providing for a percent mole conversion of the gas mixture to such oxygenated carbon compounds of at least 3, and maintaining said catalyst particles essentially free of deposits of such compounds in liquid form.

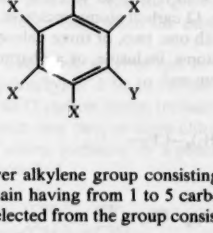
4,125,554

IODINATED THIOLCARBONATES AND METHOD FOR USE AS RADIOGRAPHIC CONTRAST AGENTS

Barry N. Newton, Lafayette, Ind., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 766,062, Feb. 7, 1977, which is a division of Ser. No. 679,393, Apr. 22, 1976, Pat. No. 4,022,814, which is a continuation-in-part of Ser. No. 501,169, Aug. 28, 1974, abandoned. This application Sep. 23, 1977, Ser. No. 836,208
Int. Cl.[2] C07C *153/11*; A61K *29/02*
U.S. Cl. 260—455 B **18 Claims**

1. A compound of the formula



wherein:

(a) R_2 is a lower alkylene group consisting of a straight or branched chain having from 1 to 5 carbon atoms;

(b) each X is selected from the group consisting of hydrogen and iodine;

(c) Y is selected from the group consisting of hydrogen,

iodine and amine, Y being iodine when all X's are hydrogen; and

(d) R_1 is a lower alkyl group consisting of a straight or branched chain having from 1 to 10 carbon atoms.

4,125,555

TRIFLUOROMETHANESULFONATES

Charles E. Reineke, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

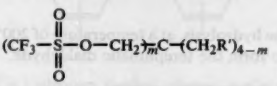
Continuation-in-part of Ser. No. 688,862, May 21, 1976, Pat. No. 4,038,245. This application May 23, 1977, Ser. No. 799,802

The portion of the term of this patent subsequent to Jul. 26, 1994, has been disclaimed.

Int. Cl.[2] **C07C** *143/68;* **C08K** *5/41;* **A61K** *31/255;* **A01N** *9/14*

U.S. Cl. 260—456 F **8 Claims**

1. An ester having the formula:



wherein m is 1 or 2 and each R′ is independently bromine or a bromophenoxy radical containing from 1 to 4 atoms of bromine.

4,125,556

SYNTHESIS OF 11-DEOXYPROSTAGLANDINS

William L. White, Holliston, Mass., and Francis Johnson, Setauket, N.Y., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 19, 1977, Ser. No. 798,537

Int. Cl.[2] **C07C** *177/00, 121/48*

U.S. Cl. 260—464 **13 Claims**

1. The method of cyclizing 1,2,4-tricarbomethoxybutane, in solution in dry p-xylene containing a trace of methanol, with excess of a suspension in dry p-xylene of a dispersion of an alkali metal hydride in mineral oil, the tricarbomethoxybutane being added portionwise to the alkali metal hydride suspension with mixing at a reaction temperature of about 20° to below about 40° C. for a time sufficient to form trans-2,3-dicarbomethoxycyclopentanone, forming the trans-2-carbobenzyloxy-3-carbomethoxycyclopentanone by alcoholysis of the 2,3-dicarbomethoxycyclopentanone with benzyl alcohol, alkylating the trans-2-carbobenzyloxy-3-carbomethoxycyclopentanone in a nucleophilic displacement with an alkylating agent having the formula $NC(CH_2)_3C{\equiv}CCH_2X$ in which X is a good leaving group to give 2-(6′-cyano-2′-hexynyl)-2-carbobenzyloxy-3-carbomethoxycyclopentanone, removing the carbobenzyloxy group at the 2-position of 2-(6′-cyano-2′-hexynyl)-2-carbobenzyloxy-3-carbomethoxycyclopentanone and simultaneously selectively reducing the hexynyl group of the 6′-cyano-2′-hexynyl moiety at the 2-position by hydrogenolysis and reduction with hydrogen in the presence of a catalytic amount of a catalyst consisting of 5% palladium on barium sulfate in the presence of pyridine to prevent over-reduction of the acetylenic group to give trans-2-(6′-cyano-cis-2′-hexenyl)-3-carbomethoxycyclopentanone, saponifying the carbomethoxy group in the 3-position on the cyclopentanone nucleus with aqueous methanolic sodium carbonate to give, upon acidification with concentrated hydrochloric acid, trans-2-(6′-cyano-cis-2′-hexenyl)-3-carboxycyclopentanone, reacting the trans-2-(6′-cyano-cis-2′-hexenyl)-3-carboxycyclopentanone with thionyl chloride in dry benzene reaction medium to form the corresponding acid chloride and reducing the latter with alkali metal borohydride in p-dioxane reaction medium to form trans-2-(6′-cyano-cis-2′-hexenyl)-3-hydroxymethylcyclopentanol, suspending the trans-2-(6′-cyano-cis-2′-hexenyl)-3-hydroxymethylcyclopentanol in a solution of alkali metal hydroxide in aqueous methanol, heating to reflux until the substrate dissolves and the cyano group is hydrolyzed to the carboxylate group, cooling the solution and backwashing several times with ether, decolorizing and chilling the resulting basic solution then neutralizing with concentrated mineral acid, recovering from the reaction medium the corresponding crude acid product and treating it with diazomethane to give the new product trans-2-(6′-carbomethoxy-cis-2′-hexenyl)-3-hydroxymethylcyclopentanol as a viscous colorless oil and oxidizing the trans-2-(6′-carbomethoxy-cis-2′-hexenyl)-3-hydroxymethylcyclopentanol in solution in methylene chloride by adding it to Collin's reagent to simultaneously oxidize the hydroxymethyl group to a formyl group and the cyclopentanol group to a cyclopentanone group and recovering the resulting trans-2-(6′-carbomethoxy-cis-2′-hexenyl)-3-formylcyclopentanone from the reaction medium.

4,125,557

HYDROSULFITE-BLEACHABLE KETONIMINE DYES FOR PAPER

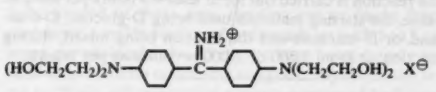
Frank F. Loffelman, and Frank F. Cesark, both of Bridgewater, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 14, 1977, Ser. No. 851,075

Int. Cl.[2] **C07C** *119/00*

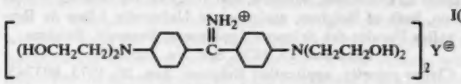
U.S. Cl. 260—501.18 **5 Claims**

1. A ketonimine dye of the formula selected from



I(a)

wherein $X^{\ominus}$ is a chloride, bromide, thiocyanate, sulfamate, formate, acetate, lactate, hydrogen sulfate or dihydrogen phosphate ion; and



I(b)

wherein $Y^{\ominus}$ is sulfate or hydrogenphosphate ion.

4,125,558

METHOD FOR THE MANUFACTURE OF THE CIS-2-HYDROXY-2-PHENYL-R-1-CYCLOHEXANECARBOXYLIC ACID

Cosimo B. Torsi, Pisa, Italy, assignor to Guidotti Internationale S.A., Italy

Filed Nov. 8, 1976, Ser. No. 739,715

Claims priority, application Italy, Nov. 12, 1975, 29221 A/75

Int. Cl.[2] **C07C** *65/14*

U.S. Cl. 562—418 **8 Claims**

1. A method for the preparation of cis-2-hydroxy-2-phenyl-r-1-cyclohexanecarboxylic acid comprising the steps of (1) reacting 1-phenyl cyclohexene with formaldehyde in the presence of formic acid; (2) hydrolyzing the reaction product of (1) is an alkaline medium to provide a mixture of 1-phenyl-cis-2-hydroxymethyl-r-1-cyclohexanol and 4-phenyl-cis-4,5-tetramethylene-1,3-dioxan; (3) separating said cyclohexanol from said dioxan; and (4) oxidizing said cyclohexanol to said carboxylic acid.

4,125,559
MANUFACTURE OF ALKALI METAL SALTS OF ARABONIC ACID

Herbert Scholz, Ludwigshafen, and Guenther Gotsmann, Frankenthal, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

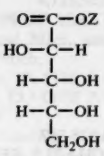
Filed May 19, 1977, Ser. No. 798,336

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1976, 2628056

Int. Cl.[2] C07C *51/26, 59/17*

U.S. Cl. 562—531 8 Claims

1. A process for the manufacture of alkali metal salts of arabonic acid, of the formula



I

where Z is an alkali metal atom, by reacting D-hexoses with oxygen and alkali metal compounds in aqueous solution, wherein one of the two starting materials D-hexose and alkali metal compound is heated, in aqueous solution, to a temperature of above 30° C. up to about 100° C., oxygen is then passed into the solution, a pressure of from 1.5 to 40 bars is set up, finally the other of the two above starting materials is added and the reaction is carried out for at least 4.5 hours per mole of D-hexose, the starting materials used being D-glucose, D-fructose and/or D-mannose and the solution being mixed, during the reaction, at from 1,200 or 2,000 revolutions per minute.

4,125,560
AROMATIC AMINES SYNTHESIS PROCESS AND PRODUCTS RESULTING FROM APPLICATION OF THIS PROCESS

Claude L. Delaunois, Brussels, and Willy O. De Graeve, Waterloo, both of Belgium, assignors to Universite Libre de Bruxelles Faculte des Sciences Appliquees, Brussels, Belgium

Filed Jul. 15, 1976, Ser. No. 705,577

Claims priority, application Belgium, Aug. 20, 1973, 803763

Int. Cl.[2] C07C *85/06*

U.S. Cl. 260—581 12 Claims

1. An aromatic amines synthesis process which comprises the ammonolysis of alkyl or polyalkyl phenols in a liquid phase by an aqueous ammonia solution containing dissolved therein a catalytic amount of an ammonium salt, said ammonolysis being effected at a temperature of from 400°–550° C and under a pressure of from 800–2,000kg/cm^2 to simultaneously degrade, isomerize and aminate said phenols.

4,125,561
PROCESS FOR PRODUCTION OF TEREPHTHALIC DIALDEHYDE

Klaus Redecker, Porz-Wahn-Heide, and Hermann Richtzenhain, Much-Schwellenbach, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

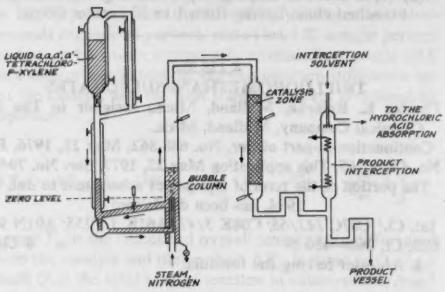
Continuation of Ser. No. 350,857, Apr. 13, 1973, abandoned. This application Mar. 15, 1977, Ser. No. 777,800

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1972, 2217782

Int. Cl.[2] C07C *45/00*

U.S. Cl. 260—599 16 Claims

1. Process for the production of terephthalic dialdehyde by hydrolysis of α,α,α′,α′-tetrachloro-p-xylene, which consists essentially of contacting liquid α,α,α′,α′-tetrachloro-p-xylene and steam in a weight ratio of steam to α,α,α′,α′-tetrachloro-p-xylene of 30–0.15 parts steam to 1 part of α,α,α′,α′-tetrachloro-p-xylene at a temperature of 120°–250° C. in a vaporization zone for production of a vapor phase containing steam and α,α,α′,α′-tetrachloro-p-xylene and contacting said vapor in a succeeding catalysis zone with an iron salt, iron oxide or a zinc



salt as catalyst for the hydrolysis, at a temperature of 200°–400° C., for hydrolysis to form the terephthalic dialdehyde.

4,125,562
PREPARATION OF 4,4′-DIHYDROXYDIPHENYLSULFONES

John I. Darragh, Runcorn, and John B. Rose, Letchworth, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 14, 1978, Ser. No. 877,735

Claims priority, application United Kingdom, Feb. 18, 1977, 6900/77

Int. Cl.[2] C07C *147/10*

U.S. Cl. 260—607 AR 9 Claims

1. A process for the manufacture of a 4,4′-dihydroxydiphenylsulphone which comprises reacting a phenol with sulphur trioxide in the presence of liquid hydrogen fluoride.

4,125,563
PROCESS FOR MAKING NITROARYLACETYLENES AND NITROARYLALDEHYDES

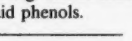
Robert H. Boschan, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 347,502, Apr. 3, 1973, abandoned. This application Aug. 26, 1977, Ser. No. 828,016

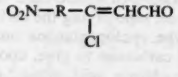
Int. Cl.[2] C07C *47/48, 79/10, 79/12*

U.S. Cl. 260—645 5 Claims

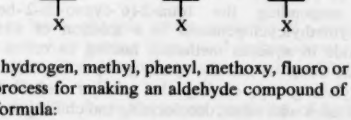
1. A process for making a compound of the following formula:



which comprises reacting in alkaline-dioxane solution a compound of the formula:

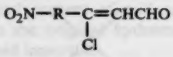


R being

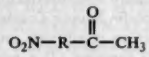


and X is hydrogen, methyl, phenyl, methoxy, fluoro or chloro.

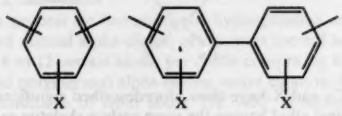
4. A process for making an aldehyde compound of the following formula:



which comprises contacting a compound of the following formula:



R being



and X is hydrogen, methyl, phenyl, methoxy, fluoro or chloro, with a solution of $POCl_3$ and dimethyl formamide to form corresponding aldehyde compound, pouring resultant solution into cold alkali bicarbonate while keeping pH of resultant mixture from 7 to about 9, and recovering precipitated aldehyde compound.

4,125,564

PROCESS FOR PRODUCING CHLOROPRENE

Takao Iwasaki; Junji Hirano, both of Ohmi, and Hideki Matsumura, Machida, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Chuo-Kenkyusho, Tokyo, Japan

Filed Nov. 2, 1977, Ser. No. 847,930

Int. Cl.[2] C07C *21/20*

U.S. Cl. 260—655 **6 Claims**

1. In a process for producing chloroprene which comprises chlorinating excess of butadiene; separating the unreacted butadiene from the reaction mixture; isomerizing 1,4-dichlorobutene-2 to 3,4-dichlorobutene-1; reacting 3,4-dichlorobutene-1 with a base to obtain chloroprene, an improvement characterized by reacting 3,4-dichlorobutene-1 with a base in the presence of thiodiphenyl amine and 2,6-ditertiarybutyl-p-cresol, whereby a clogging of an equipment is prevented.

4,125,565

DEHYDROGENATION METHOD AND NONACIDIC MULTIMETALLIC CATALYTIC COMPOSITE FOR USE THEREIN

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 724,892, Sep. 20, 1976, Pat. No. 4,036,473. This application Jul. 8, 1977, Ser. No. 813,905

The portion of the term of this patent subsequent to Jul. 19, 1994, has been disclaimed.

Int. Cl.[2] C07C *15/02, 3/28, 5/32;* B01J *23/64*

U.S. Cl. 260—668 D **35 Claims**

1. A method for dehydrogenating a dehydrogenatable hydrocarbon comprising contacting the hydrocarbon, at dehydrogenation conditions, with a catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % nickel, and about 0.01 to about 5 wt. % bismuth; wherein the platinum group metal, catalytically available nickel and bismuth are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; and wherein substantially all of the catalytically available nickel is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under dehydrogenation conditions or in a mixture of these states.

4,125,566

PROCESS FOR UPGRADING EFFLUENTS FROM SYNTHESES OF THE FISCHER-TROPSCH TYPE

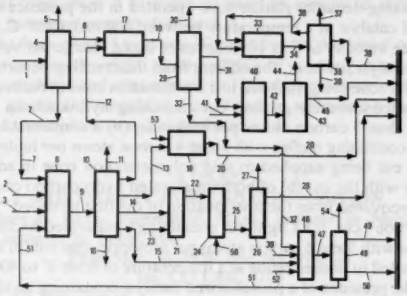
Chan Trin Dinh, Le Vesinet; Jean-Francois Le Page, Rueil Malmaison; Jean Cosyns, Maule; Germain Martino, Poissy, and Jean Miquel, Paris, all of France, assignors to Institut Francais du Petrole, France

Filed Aug. 17, 1977, Ser. No. 825,357

Claims priority, application France, Aug. 17, 1976, 76 25146

Int. Cl.[2] C07C *1/04;* C10G *7/06, 37/10*

U.S. Cl. 260—676 R **5 Claims**



1. A process for increasing the value of effluents from syntheses of the Fischer-Tropsch type, these effluents being essentially formed of three cuts, the first cut or "light fraction" containing a major portion of hydrocarbons with 3 to 6 carbon atoms per molecule, these hydrocarbons being largely unsaturated ones and also containing oxygen compounds, the second cut or "light oil" containing a major portion of hydrocarbons whose lightest have 5 carbon atoms per molecule and whose heaviest have an ASTM final distillation point of about 300° C., said "light oil" also containing organic oxygen compounds, the third cut or "decanted oil" containing a major portion of hydrocarbons of distillation point between about 300° C. and 500° C. and also containing organic oxygen compounds, in which process the so-called light fraction cut is subjected to fractionation to obtain (a) a gaseous cut of low volume with respect to the light fraction, (b) a cut containing a large proportion of unsaturated hydrocarbons and consisting essentially of hydrocarbons with 3 and 4 carbon atoms per molecule and (c) a cut consisting of C_5^+ hydrocarbons and also containing oxygen compounds, to be treated as hereunder stated, in which process the cut (b) of high unsaturated hydrocarbon content is treated in admixture with another cut (b) of condensable gas, as hereinafter defined, in a polymerization zone, in the presence of a catalyst of the acid type, at a temperature between 100° and 400° C. under a pressure between about 1 and 200 kg/cm^2, at a liquid hydrocarbon feed rate of about 0.05 to 5 volumes per volume of catalyst per hour, the effluent of the polymerization zone being supplied to a fractionation zone to obtain (α) a fraction of high content of relatively light normal and iso olefins and paraffins, (β) a fraction of high gasoline content, comprising hydrocarbons whose lightest have 5 carbon atoms and heaviest have an ASTM final distillation point of about 200° C. (C_5^+ – 200° C.) and (γ) a fraction of high kerosene and gasoil content, the ASTM final distillation point being higher than about 200° C., in which process and fraction (β) of high content in relatively light olefins and paraffins is subjected at least in part to an alkylation reaction, the effluent from the alkylation zone being subjected to fractionation to recover (1) at least one light hydrocarbon cut containing isoparaffins and normal paraffins of 3 and 4 carbon atoms per molecule, (2) an alkylate useful as motor gasoline and (3) a residue, in which process said fraction (β) of high gasoline (C_5^+ – 200° C.) content recovered from the fractionation zone following the polymerization zone is treated in a hydrotreatment zone, the effluent from the hydrotreatment zone being supplied to a

fractionation zone to recover essentially a motor gasoline cut of high purity, in which process said fraction (γ) of high kerosene and gas oil content, as recovered from the fractionation zone following the polymerization zone is supplied in admixture with a heavy cut whose origin is defined hereunder and comprising hydrocarbons ranging from those with 11 carbon atoms per molecule up to those having an ASTM final distillation point of 380° C., to a hydrotreatment zone, as hereinafter stated, in which process the so-called "light oil" second cut and the so-called "decanted-oil" third cut, in admixture with said cut (c) of C_5^+ hydrocarbons recovered from the fractionation of the said "light fraction" first cut, are supplied to a cracking-decarboxylation zone operated in the presence of an acid catalyst at a temperature between 400 and 1200° C., at a space velocity of 2 to 10 volumes of liquid charge per volume of catalyst per hour, the effluent from the cracking-decarboxylation zone being supplied to a fractionation zone to recover (a) an uncondensable gaseous cut containing hydrocarbons with less than 3 carbon atoms per molecule, (b) a condensable gas cut containing olefins with 3 and 4 carbon atoms per molecule, this cut being supplied to said polymerization zone in admixture with the cut (b) of high unsaturated hydrocarbon content as recovered from the fractionation of the first so-called "light fraction" cut, (c) a light cut containing unsaturated hydrocarbons with 5 and 6 carbon atoms per molecule, that cut (c) being sujected to isomerization at a temperature of from 0° to 400° C. in the presence of a presulfurized catalyst containing an alumina-based carrier and a metal from group VIII of the periodic classification of the elements, so as to obtain a motor gasoline fraction of high purity, (d) a heavy gasoline cut comprising hydrocarbons with 7 to 10 carbon atoms per molecule, said cut (d) being subjected to hydrotreatment to eliminate olefins and oxygen compounds, the effluent from the hydrotreatment being subjected to hydro reforming, the effluent from the reforming being fractionated to recover a gasoline fraction of high quality, (e) a cut comprising hydrocarbons ranging from those with 11 carbon atoms per molecule up to those having an ASTM final distillation point of about 360° C. or more, and (f) a residue of tar and other heavy products, in which process said cut (e) is admixed with said fraction (γ) of high kerosene and gas oil content recovered from the fractionation zone following the polymerization zone and also with said residue (3) obtained when fractionating the effluent from said alkylation zone, and the mixture supplied to a hydrotreatment zone, the effluent from the hydrotreatment zone being subjected to fractionation to recover (a) a gas fraction, (b) a kerosene fraction, (c) a gas oil fraction and (d) column bottoms.

4,125,567

TERMINAL OLEFIN PREPARATION

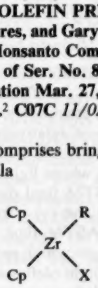
Roger L. Kidwell, Des Peres, and Gary J. Lynch, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 812,545, Jul. 5, 1977, abandoned. This application Mar. 27, 1978, Ser. No. 890,436

Int. Cl.[2] **C07C** *11/02, 5/22*

U.S. Cl. 260—677 R **27 Claims**

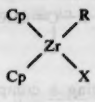
1. A process which comprises bringing together (1) a compound having the formula



wherein each Cp is a π-cyclopentadienyl radical, R is terminal alkyl and X is an essentially non-interfering monovalent entity and (2) mono-olefin having a carbon skeleton different from that of R under reaction conditions to displace R from (1) with (2).

16. A process for isomerizing an internal olefin to a terminal olefin, which process comprises the following steps:

(A) subjecting (1) a compound having the formula



wherein each Cp is a π-cyclopentadienyl radical, R is terminal alkyl and X is an essentially non-interfering monovalent entity and (2) internal mono-olefin having a carbon skeleton different from that of R to reaction conditions under which R is displaced from (1) by (2) forming (3) a compound having the formula

wherein Cp and X have their aforedescribed significance and R′ is terminal alkyl having the same carbon skeleton as (2) and

(B) subjecting (3) formed by Step (A) and (4) mono-olefin having a carbon skeleton different from that of R′ to reaction conditions under which R′ is displaced from (3) by (4) forming terminal olefin having the same carbon skeleton as (2).

4,125,568

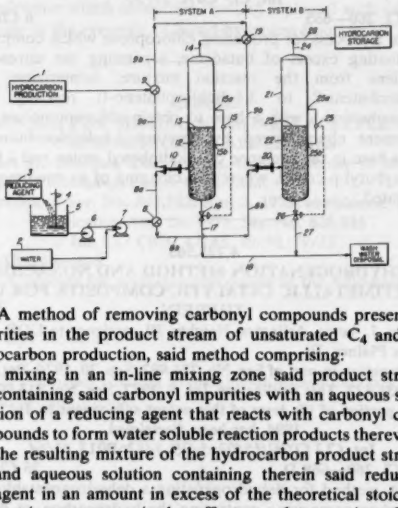
REMOVAL OF CARBONYL IMPURITIES

Walter A. Theriot, New York, N.Y.; Steven D. Saucier, and B. M. Drinkard, both of Beaumont, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 29, 1977, Ser. No. 811,106

Int. Cl.[2] **C07C** *7/10*

U.S. Cl. 260—681.5 **8 Claims**



1. A method of removing carbonyl compounds present as impurities in the product stream of unsaturated C_4 and C_5 hydrocarbon production, said method comprising:

(a) mixing in an in-line mixing zone said product stream containing said carbonyl impurities with an aqueous solution of a reducing agent that reacts with carbonyl compounds to form water soluble reaction products therewith, the resulting mixture of the hydrocarbon product stream and aqueous solution containing therein said reducing agent in an amount in excess of the theoretical stoichiometric amount required to effect complete reaction of said reducing agent and said carbonyl impurities;

(b) passing the resulting mixture from said in-line mixing zone to a phase separating zone wherein the organic phase of said mixture is substantially separated from the aqueous phase of said mixture, thereby providing:

(1) an aqueous phase comprising a water solution of the reaction products of said reducing agent with said carbonyl impurities along with unreacted reducing agent, and

(2) an organic phase comprising the unsaturated hydrocarbon product; and

(c) withdrawing said separated organic phase from said

phase separating zone as an organic phase having significantly reduced content of said carbonyl impurities as compared to the original hydrocarbon product stream containing said impurities.

4,125,569

PROCESS FOR INCREASING HYDROGENATION RATE OF POLYMERIZED N-ALPHAOLEFINS

Steven M. Jackson, North Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 25, 1977, Ser. No. 827,532
Int. Cl.[2] C07C *5/04*
U.S. Cl. 260—683.9 **12 Claims**

1. A process for increasing the hydrogenation rate of polymerized normal alpha-olefins or mixtures thereof having from about 6 to 12 carbon atoms per olefin comprising hydrogenating said polymerized alpha-olefins under catalytic hydrogenation conditions of from about 150°–400° C and from about 300–500 psig in the presence of added alumina, and a suitable hydrogenation catalyst in a weight ratio of catalyst to alumina of from about 0.05–2 to 1 and wherein the hydrogenation catalyst is selected from the group consisting of metals from Groups VIII and IB of the periodic Table, salts thereof and mixtures of said metals and or said salts.

4,125,570

METHOD OF STABILIZING THE GLOSS RETENTION OF THERMOSETTING RESINS CONTAINING HYDROXYL GROUPS

Wen-Hsuan Chang, Gibsonia; Samuel Porter, Jr., Tarentum, and Marco Wismer, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 361,011, May 16, 1973, abandoned.
This application Mar. 4, 1977, Ser. No. 774,296
Int. Cl.[2] C08L *61/20, 61/32*
U.S. Cl. 260—849 **12 Claims**

1. A stabilized coating composition comprising a polymeric polyol selected from the group consisting of polyester polyols, polyether polyols, polyurethane polyols and hydroxyl containing polyacrylates, an aminoplast resin to cure said polymeric polyol and 1,4-diazo[2,2,2]-bicyclooctane being present in an amount sufficient to stabilize the gloss retention of said coating composition.

4,125,571

THERMOPLASTIC MOLDING COMPOSITION

Steven W. Scott, and Allen D. Wambach, both of Evansville, Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 14, 1976, Ser. No. 750,556
Int. Cl.[2] C08L *67/02*
U.S. Cl. 260—860 **14 Claims**

1. A thermoplastic molding composition which consists essentially of a combination of polyesters consisting of:

a. a poly(1,4-butylene terephthalate) resin or a copolyester thereof with a minor amount of an aliphatic or aromatic dicarboxylic acid or an aliphatic polyol;

b. a polyester resin derived from a cyclohexanedimethanol and a hexacarbocyclic dicarboxylic acid.

6. A reinforced thermoplastic molding composition which consists essentially of:

(i) a combination of polyesters consisting of

(a) a poly(1,4-butylene terephthalate) resin or a copolyester thereof with a minor amount of an aliphatic or aromatic dicarbocyclic acid or an aliphatic polyol, and

(b) a polyester resin derived from a cyclohexanedimethanol and a hexacarbocyclic dicarboxylic acid; and

(ii) a reinforcing amount of a reinforcing filler.

4,125,572

THERMOPLASTIC MOLDING COMPOSITION

Steven W. Scott, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 14, 1976, Ser. No. 750,557
Int. C.[2] C08L *67/02*
U.S. Cl. 260—860 **13 Claims**

1. A thermoplastic molding composition which consists essentially of:

(i) from about 40 to about 95 parts by weight of a polycarbonate resin; and

(ii) a polyester consisting of

(a) from about 5 to about 60 parts by weight of poly(1,4-butylene terephthalate) and

(b) from about 1 to about 60 parts by weight, based on the combined weight of (i) and (a), of a copolyester of an aliphatic diol containing 2 to 18 carbon atoms or cycloaliphatic diol containing 6 to 18 carbon atoms and a mixture of terephthalic and isophthalic acids.

4,125,573

POLYMER POLYBLEND COMPOSITION

Robert L. Kruse, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 26, 1976, Ser. No. 670,938
Int. Cl.[2] C08L *9/06*
U.S. Cl. 260—876 R **11 Claims**

1. An improved polymeric polyblend composition characterized by a blend of:

A. a polymer of at least one monoalkenyl aromatic monomer having dispersed therein an amount sufficient to toughen said polymer of

B. a diene rubber, said rubber being dispersed as crosslinked rubber particles being grafted with said monomer as polymer and having occluded therein said polymer, said particles having a weight average diameter of from about 0.5 to 10 microns, wherein said improvement comprises:

C. said diene rubber being a polybutadiene rubber having a broad molecular weight distribution characterized by having a dispersion index from about 2 to 6 a weight average molecular weight of from about 250,000 to 750,000 and a number average molecular weight of from about 125,000 to 200,000, and a microstructure having a cis-1,4 isomer content of from about 30 to 85 percent.

4,125,574

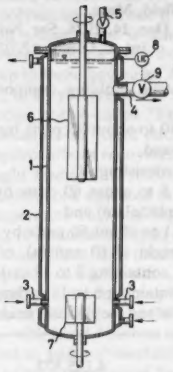
PROCESS AND APPARATUS FOR THE CONTINUOUS PRODUCTION OF VINYL CHLORIDE POLYMERS IN AQUEOUS EMULSION

Paul Kastner, Burgkirchen, Alz, and Christoph Heinze, Burghausen, Salzach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 1, 1977, Ser. No. 802,493
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1976, 2625149
Int. Cl.[2] C08F *2/22, 14/06, 291/02*
U.S. Cl. 260—884 **7 Claims**

1. In a process for the continuous production of vinyl chloride homo-, co- or graft polymers in aqueous emulsion in the presence of radical-forming catalysts, surface active substances in the upright, cylindrical vessel with a ratio of height to diameter of at least 3 and a capacity of at least 5 m^3, whilst stirring the polymerization mixture and regulating the level of the liquid in the vessel, the improvement which comprises discharging the polymerization emulsion from the vessel at the side at a level which is situated 30 to 90% of the total internal height of the vessel above the inlet for the starting substances and at least 15 cm below the surface of the liquid, regulating the standing level of the liquid to a maximum of 97% of the total internal height of the vessel and stirring the content of the

vessel by at least one stirring device which extends in the liquid over 15 to 60% of the total internal height of the vessel, ends



at least 20 cm below the surface of the liquid and stays at a distance of at least 15 cm from the vessel wall.

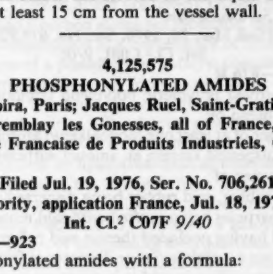
4,125,575

PHOSPHONYLATED AMIDES

Joseph Schapira, Paris; Jacques Ruel, Saint-Gratien, and Alain Bleriot, Tremblay les Gonesses, all of France, assignors to Compagnie Francaise de Produits Industriels, Gennevilliers, France

Filed Jul. 19, 1976, Ser. No. 706,261
Claims priority, application France, Jul. 18, 1975, 75 22578
Int. Cl.[2] C07F *9/40*
U.S. Cl. 260—923 **12 Claims**

1. Phosphonylated amides with a formula:



in which:

R_1 and R_2 represent an alkyl, haloalkyl or alkenyl radical having 1 to 4 atoms of carbon;

Z_1 and Z_2 represent a residue of a compound containing more than one atom of nitrogen chosen from the group made up of guanidine, alkylguanidines, ethylenediamine, diethylenetriamine, triethylenetetramine, aminoguanidine and hydrazine and its derivatives, and their methylolated or alcoxymethylated derivatives;

p represents the number 1 or 2, except when Z_1 is quanidine or an alkylguanidine in which case $p = 1$.

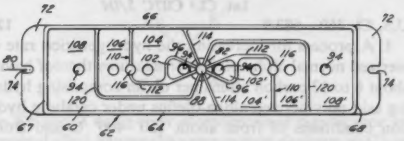
4,125,576

WATER DISTRIBUTOR TROUGH PRIMARILY FOR A WARM AIR FURNACE MOUNTED HUMIDIFIER

Richard C. Kozinski, Warren, Mich., assignor to General Filters, Inc., Novi, Mich.

Filed Sep. 19, 1977, Ser. No. 834,122
Int. Cl.[2] F24F *3/14*
U.S. Cl. 261—106 **20 Claims**

1. An air treating apparatus comprising a housing, evaporator means mounted in said housing, water distribution means disposed above said evaporator means for providing a substantially uniformly distributed flow of water to said evaporator means, said water distribution means comprising a tray having a bottom wall and an upright continuous wall, a target element extending upwardly from the bottom wall of said tray, said target element having a side wall and being provided on the upper end thereof with a top surface divided into an inner zone and an outer zone, a first pair of internal vertical wall elements extending upwardly from the bottom wall of said tray and located on opposite sides of said target element, each of said first pair of internal wall elements having a pair of end surfaces which abut and are secured to said target element and define a channel, a plurality of additional internal wall elements on opposite sides of said target element, each of said additional internal wall elements having a pair of end surfaces which abut



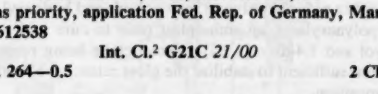
and are secured on one end surface to said target element and on the other end surface to said continuous wall of said tray and define a channel, a plurality of longitudinally spaced apertures formed in the bottom wall of said tray, one aperture being provided for each channel, the top edges of said internal wall elements intersecting said target element, whereby water directed to the apparatus impinges with a certain velocity head on the top surface of said target element from where the water flows and while still in motion impinges upon the top edges of said internal wall elements which divides and directs the flowing water into said channels and from where the water is distributed to the evaporator means through said apertures.

4,125,577

METHOD OF AUTOMATICALLY FILLING NUCLEAR FUEL ROD JACKET TUBES

Helmut Bezold, Erlangen, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Mar. 21, 1977, Ser. No. 779,756
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1976, 2612538
Int. Cl.[2] G21C *21/00*
U.S. Cl. 264—0.5 **2 Claims**



1. Method of automatically filling jacket tubes for fuel rods of nuclear reactors with nuclear fuel pellets in combination with subsequent closure of the jacket tubes by automated welding of end caps thereon, which comprises introducing the nuclear fuel pellets row-wise into a receiving tube of a collecting magazine therefor, passing the magazine containing the nuclear fuel pellets through a drying furnace to remove traces of moisture therefrom, subsequently delivering the magazine containing the moistureless nuclear fuel pellets to a filling station to which, respectively, an empty jacket tube has been fed from a tube magazine, weighing the empty jacket tube, then filling the empty jacket tube with fuel pellets in a column from the receiving tubes of the collecting magazine by mechanically displaced pushrods until a given extent of fullness thereof depending upon the length and weight of the pellet column has been attained, delivering the filled jacket tube to a further processing station for introducing insulating tablets, support sleeves and springs thereto and, after final checking,

transferring the jacket sleeve to welding apparatus for welding end caps thereon.

4,125,578

RECLAIMED VULCANIZED RUBBER

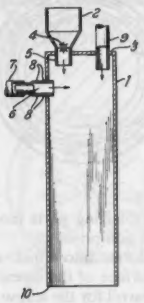
Derek W. Sear, Wilmslow, England, assignor to Setech International Limited, St. Peter Port, United Kingdom

Continuation of Ser. No. 561,255, Mar. 24, 1975, abandoned. This application Jun. 1, 1977, Ser. No. 802,557

Claims priority, application United Kingdom, Mar. 29, 1974, 14168/74

Int. Cl.[2] C01B *31/02*; B29H *19/00*

U.S. Cl. 264—29.5 **10 Claims**



1. A method of reclaiming vulcanised rubber which comprises the step of searing the surface of vulcanised rubber by direct application thereto of at least one flame for a time insufficient for the vulcanised rubber to ignite and thereby causing a surface layer of the vulcanised rubber to be rendered plastic by devulcanisation whilst an inner core of the rubber remains vulcanised and non-plastic.

6. A method of reclaiming vulcanised rubber which comprises the step of causing the surfaces of vulcanised rubber crumb to be seared by exposing the vulcanised rubber crumb directly heated gases which gases directly heat the rubber crumb to a temperature at which the surface of the rubber sears, the exposure being for a time insufficient for burning to commence, whereby the surface layers of the rubber crumb are rendered plastic by devulcanisation, whilst the inner cores of the rubber crumb remain vulcanised and nonplastic.

4,125,579

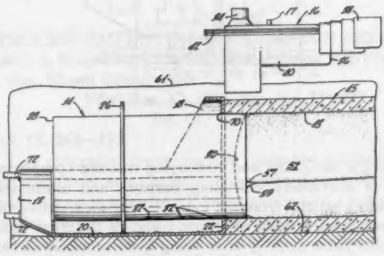
CONCRETE PIPE FORMING MACHINE

Thomas W. Barber, El Toro, and Miles W. Proctor, Santa Ana, both of Calif., assignors to Donovan Construction Company, Irvine, Calif.

Division of Ser. No. 590,257, Jun. 25, 1975, abandoned. This application Jan. 24, 1977, Ser. No. 762,064

Int. Cl.[2] E04B *1/16*

U.S. Cl. 264—32 **2 Claims**



1. A method of temporarily stopping the process of forming in place concrete pipe in a trench using an apparatus comprising an interior forming member, an upper exterior forming member and a connecting support member without having to completely remove said apparatus from said trench, said support member having its rear portion holding said inner forming member spaced from the trench bottom and the exterior member to define a tubular space and including a wall defining the forward end wall of the space, said concrete being introduced under pressure from a source external said members, said method comprising the steps of:

stopping the flow of concrete into said space;

disconnecting said interior forming member from said support member;

holding said support member in a stationary position with said end wall supporting the end of the newly formed pipe;

moving said interior forming member forward relative said support member; and

removing said exterior forming member from said support member.

2. A method of forming in place concrete pipe with a pipe forming apparatus and for allowing stops during said forming without having to completely remove said apparatus from adjacent said pipe, said method comprising the steps of:

positioning an internal form member connected to the rear of a support member which holds the form member spaced from the surface of a trench and forms an annular forward end wall;

positioning an external form member spaced over said internal form member adjacent the top of said trench;

introducing concrete into said space between said internal form member and said trench and between said internal form member and said external form member, said space being open on its rear end and bounded by said end wall on its forward end;

moving said internal and external form members forward in said trench as said concrete is compacted in said space;

stopping said introduction of concrete into said space ceasing said forward movement of said internal and external form members;

disconnecting said internal form member from said support member;

holding said support member stationary adjacent said pipe;

moving said internal form member forward through said support member end wall to a temporary position where said internal form member remains partially within said pipe;

holding said internal form member stationary in said temporary position when the pipe forming process is to be resumed;

moving said support member forward adjacent said temporary position of said internal form member;

attaching said internal form member to said support member;

introducing concrete into said space;

moving said internal and external form members forward as said concrete is compacted in said space.

4,125,580

PROCESS FOR THE MANUFACTURE OF PRETENSIONED CARRIAGEWAY SLABS

Erich Lippert, Wessling, Germany, assignor to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Germany

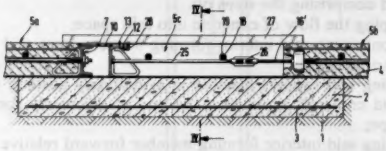
Filed May 2, 1977, Ser. No. 792,512

Int. Cl.[2] E04B *1/16*

U.S. Cl. 264—34 **4 Claims**

1. Process for the manufacture of carriageway slab or the like which comprises at least two sections, each of which are prestressed throughout their length and breadth and including expansion joints between the sections, each expansion joint comprising the end plates of the two sections separated by a groove and covered by a bridging plate attached to one of the end plates and under which plate the end portion of the adja-

cent section is slidable, the improvement comprising concreting the main portion of a new section except for a relatively small portion adjacent the expansion joint, said main portion containing embedded jacketed tensioning rods extending from the end plate opposite the expansion joint and into the non-concreted portion of the section, tensioning said tensioning rods and fixing them under tension at the end of said concreted portion, said end plate adjacent said expansion joints containing tendons extending toward the ends of the tensioning rods in the non-concreted area, fixing the position of the two end plates at the expansion joint with respect to each other, securing the ends of the tendons to the ends of the corresponding tensioning members and placing the tendons under tension, concreting the space remaining in said section and then releasing the plates at the expansion joints whereby by the tension applied to the tendons is applied to stress the last applied concrete.



4,125,581

MULTI-LAYER PRODUCTS

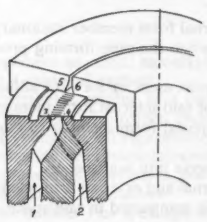
Ole-Bendt Rasmussen, Topstykket 7, 3460 Birkerød, Denmark

Continuation of Ser. No. 421,270, Dec. 3, 1973, abandoned, Ser. No. 694,660, Dec. 29, 1967, Pat. No. 3,547,761, Ser. No. 751,205, Aug. 8, 1968, abandoned, and Ser. No. 757,237, Aug. 8, 1968, abandoned, said Ser. No. 421,270, is a continuation of Ser. No. 75,229, Sep. 24, 1970, abandoned, which is a continuation-in-part of Ser. No. 871,688, Nov. 19, 1969, abandoned, which is a continuation of Ser. No. 694,433, Dec. 29, 1967, abandoned. This application Aug. 25, 1975, Ser. No. 607,695

Claims priority, application United Kingdom, Dec. 30, 1966, 58429/66; Aug. 9, 1967, 36531/67

Int. Cl.[2] B29D *7/02*

U.S. Cl. 264—49 **15 Claims**



1. A method of producing fibrous products, including single fibers, yarn and fibrous webs, of improved fineness from extruded sheet material which comprises the steps of extruding in the form of a sheet-like, multi-layer composite stream a plurality of extrudable materials, at least one of which is a synthetic thermoplastic fiber-forming polymer and another of which is removable of mechanical, chemical, or solvent action of a combination thereof, said layers extending generally parallel to the faces of said stream, each such layer containing either said fiber-forming polymer or said removable extrudable material with the different layers being interspersed in said composite stream, solidifying said composite stream into a multilayer sheet, then splitting said solid sheet to convert the same into a coarse fibrous product, and treating the thus produced fibrous product by mechanical, chemical, or solvent action or a combination thereof to at least partially remove said removable material and produce a fibrous product of increased fineness.

4,125,582

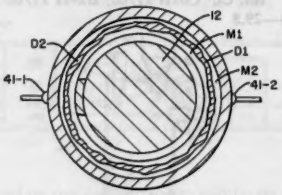
MARBLEIZATION OF PLASTIC MATERIALS

James L. Langlois, Shrewsbury, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Feb. 23, 1976, Ser. No. 660,008

Int. Cl.[2] B29C *9/00, 69/00*

U.S. Cl. 264—73 **5 Claims**



1. The method of marbleizing parts molded with a screw injection machine which comprises

(a) injecting liquid colorant into a melt within the machine between a heated surface of the screw and a heated interior surface of the barrel for the screw at a comparatively high pressure to form a band of colorant at an intermediate level between the two surfaces;

(b) ejecting the melt from the machine with said band of colorant maintained at an intermediate level within the melt; and

(c) forcing the ejected melt into a mold to produce a marbleized part.

4,125,583

METHOD FOR THE FURTHER CONVEYING OF THE HOLLOW ARTICLES EJECTED BY HOLLOW ARTICLE BLOW-MOULDING MACHINES

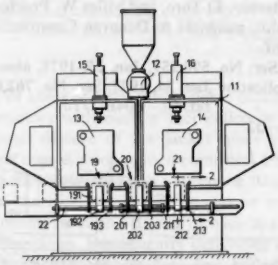
Stefan Fischer, Im Korresgarten 21, Lohmar, and Helmut Scharrenbroich, Neuenhaus 21, Neunkirchen-Seelscheid, both of Fed. Rep. of Germany

Continuation of Ser. No. 471,582, May 20, 1974, abandoned. This application Mar. 1, 1977, Ser. No. 773,146

Claims priority, application Fed. Rep. of Germany, May 18, 1973, 2325283

Int. Cl.[2] B29C *17/07*

U.S. Cl. 264—98 **6 Claims**



1. An article moulding and conveying method comprising the steps of alternately extruding parisons and alternately blow-moulding articles from the extruded parisons, delivering the blow-moulded articles alternately and at different times along parallel paths directly after being blow moulded to two stationary constantly spaced points of deposit along a predetermined path of article travel, said two constantly spaced points defining a first predetermined distance between each other,

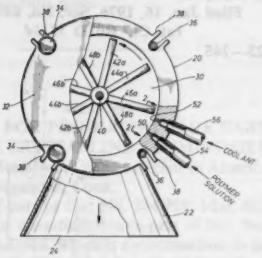
intermittently moving deposited articles as a constantly spaced group at a time between the alternate delivery of any two successively delivered blow-moulded articles, the intermittent movement being in a first direction along the predetermined path of article travel a second distance, and the first predetermined distance being an even numbered multiple of the second distance.

4,125,584

PROCESS FOR THE MANUFACTURE OF FIBRILS

Robert E. Boehme, and Clarence R. Murphy, both of Houston, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa. and Champion International Corporation, Stamford, Conn.

Filed Jul. 1, 1977, Ser. No. 812,031
Int. Cl.[2] C08G *51/12*; B24D *3/00*
U.S. Cl. 264—142 3 Claims



1. A process for preparing fibrils from a hot viscous solution of a thermoplastic polymer which consists essentially of:

a. rotating an impeller at high speed in a cylindrical cavity, said impeller having a plurality of blades whose tips come in close proximity to the inner peripheral surface of said cylindrical cavity, the blades of said impeller having their narrow dimension substantially in the plane of impeller rotation,

b. feeding a stream of a hot viscous solution of thermoplastic polymer into said cylindrical cavity to impinge upon the blades of said impeller near their tips so that said polymer solution contacts said blades, is broken up into droplets and/or thin streams which flow over the surfaces of said blades whereby the polymer solution is subjected to high shear stresses and attenuated to orient the solute polymer molecule in said polymer solution,

c. feeding a stream of coolant liquid into said cylindrical cavity to impinge upon the blades of said impeller near their tips so that said coolant liquid is broken up into droplets and/or thin streams which flow over the surfaces of said blades, and cool the polymer solution in contact therewith to precipitate fibrils therefrom, and

d. withdrawing a stream of fibrils, polymer solvent, and coolant liquid from the cylindrical cavity.

4,125,585

PROCESS EMPLOYING COEXTRUSION FEEDBLOCK

Larry A. Rosenbaum, Marion, Ohio, assignor to HPM Corporation, Mount Gilead, Ohio

Filed Dec. 17, 1976, Ser. No. 751,887
Int. Cl.[2] B29F *3/10*
U.S. Cl. 264—173 11 Claims

1. A process of preparing two dissimilar synthetic resinous material flows as an annular composite flow with three concentric strata in a feedblock for extrusion into a self-supporting tubular form comprising the steps of:

supplying a first generally cylindrical flow of synthetic resinous material to a feedblock;

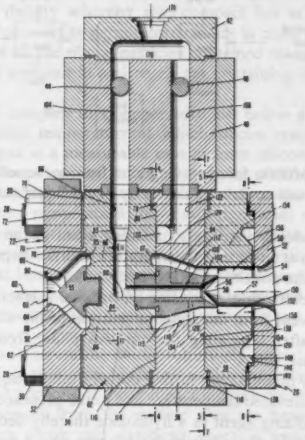
supplying a second generally cylindrical flow of a second synthetic resinous material to the feedblock;

splitting the second generally cylindrical flow into a first portion and a second portion;

shaping the first cylindrical flow into a first annular stratum in the feedblock which first stratum is essentially free of a circumferential maldistribution;

shaping the first portion into a second annular stratum in the feedblock which second annular stratum is essentially free of a circumferential maldistribution;

moving the first annular stratum into confluence with the



second annular stratum such that uniform radial properties prevail in both strata thereby inhibiting formation of perturbations;

shaping the second portion into a third annular stratum in the feedblock which third annular stratum is essentially free of a circumferential maldistribution; and

applying the third annular stratum to the first stratum such that uniform radial properties prevail in the first and third strata thereby inhibiting perturbation formation and obtaining a radially stratified annular flow.

4,125,586

REMOVAL OF $ALCL_3$ FROM CRUDE $TICL_4$ BY ADDITION OF H_2O AND NACL

Hans H. Glaeser, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 20, 1978, Ser. No. 871,117
Int. Cl.[2] C01G *23/02*
U.S. Cl. 423—84 4 Claims

1. In a process for the removal of aluminum chloride from a liquid solution thereof with a liquid mixture of metal chlorides resulting from the chlorination of titaniferous materials comprising mixing water with the liquid mixture to form an insoluble compound with aluminum and separating the compound therefrom,

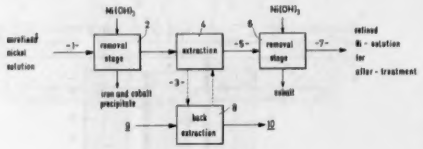
the improvement for insuring the complete separation of aluminum chloride essentially without loss of the titanium tetrachloride component of the liquid mixture comprising mixing water and sodium chloride with the liquid mixture wherein the amount of water is less than equimolar with respect to the total amount of aluminum in the ore and wherein the combined amount of water and sodium chloride is at least equimolar with respect to the total amount of aluminum in the ore.

4,125,587

REMOVING ZINC FROM A NICKEL SOLUTION BY EXTRACTION

Raimo J. Leimala, and Matti Seilo, both of Harjavalta, Finland, assignors to Outukumpu OY, Finland

Filed Oct. 12, 1977, Ser. No. 841,286
Claims priority, application Finland, Oct. 12, 1976, 762910
Int. Cl.[2] C01G *53/00*
U.S. Cl. 423—139 **5 Claims**



1. A process for removing zinc from an aqueous solution of a nickel salt containing cobalt by liquid-liquid extraction, comprising:

first adding a strongly oxidizing agent to the aqueous solution at an elevated temperature in order to precipitate part of the cobalt as Co(III) hydroxide;

then extracting zinc using an organic extraction agent and solvent from the aqueous solution of the nickel salt;

thereafter separating the aqueous phase from the organic phase; and

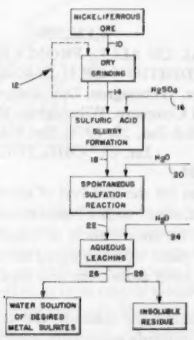
finally precipitating further cobalt from the aqueous phase at an elevated temperature and in the presence of a strongly oxidizing agent as a hydroxide thereby decomposing the organic phase left in the aqueous phase and absorbing it into the precipitate.

4,125,588

NICKEL AND MAGNESIA RECOVERY FROM LATERITES BY LOW TEMPERATURE SELF-SULFATION

Barry J. Hansen, Hibbing; James C. Stensrud, Grand Rapids; Adolfo R. Zambrano, and Dennis D. Chilcote, both of Hibbing, all of Minn., assignors to The Hanna Mining Company, Cleveland, Ohio

Filed Aug. 1, 1977, Ser. No. 820,846
Int. Cl.[2] C01G *53/10, 49/14;* C01F *5/40*
U.S. Cl. 423—150 **9 Claims**



1. A process for refining nickeliferrous ores containing large amounts of magnesia and silica and recovering iron, nickel and magnesium containing reduced amounts of silica which comprises the steps of

(a) grinding the ore to reduce the particles size of the ore,

(b) preparing a slurry of the ground ore in sulfuric acid containing less than ten percent of water,

(c) adding water to the acid:ore slurry in an amout which is effective to initiate a sulfation reaction,

(d) allowing the sulfation reaction to continue at a temperature of from about 150°–210° C for a period of from about 3 to about 10 minutes utilizing the heat of the sulfation reaction, whereby water-soluble metal sulfates are formed,

(e) leaching the sulfation product with water to extract the water-soluble salts of iron, nickel and magnesium from the insoluble residue, and

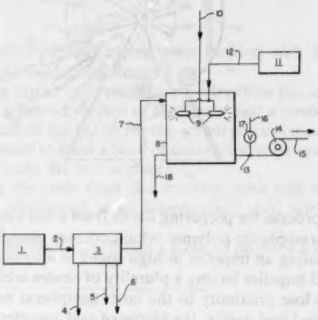
(f) recovering the nickel, magnesium and iron from the leach solution.

4,125,589

ODOR CONTROL SYSTEM

Egbert deVries, Kettering, Ohio, assignor to Quad Corporation, Highland Park, Ill.

Filed Jan. 16, 1976, Ser. No. 649,696
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—245 **11 Claims**



1. A process for treating vapors containing offensive or foul-smelling constituents comprising organic sulfides, amines, aldehydes, ketones, alcohols and the like; which comprises

passing the vapors through a condensing zone to remove condensable constituents from said vapors;

treating said uncondensed vapors in a spray treatment zone, said treatment consisting of the following steps:

(a) passing the uncondensed vapors into the upper region of a spray treatment zone;

(b) introducing into the upper portion of said treatment zone a finely divided spray consisting essentially of water and an oxidising agent and having a droplet diameter of up to about 10 microns;

(c) allowing the droplets to fall unimpeded through the spray treatment zone for at least about 20 seconds whereby offensive or foul-smelling constituents are removed from said vapor;

(d) removing treated vapor from the lower portion of the treatment zone, and;

(e) separately removing settled out spray liquid, now containing said offensive and foul-smelling material, from the lower portion of the treatment zone.

4,125,590

METHOD FOR MANUFACTURING BORON TRICHLORIDE

Laurence F. Schmoyer, Edmond, Okla., assignor to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Jun. 29, 1977, Ser. No. 811,195
Int. Cl.[2] C01B *35/06*
U.S. Cl. 423—292 **4 Claims**

1. A process for producing boron trichloride which comprises:

introducing boron containing ore consisting essentially of sodium tetraborate into a reaction zone;
introducing carbon into said reaction zone;
heating said reaction zone to an elevated temperature to produce a molten reaction mixture consisting essentially of said boron-containing ore and carbon;
introducing chlorine gas into said molten reaction mixture to form molten by-products and gaseous products comprising crude boron trichloride within said reaction zone;
maintaining the reaction zone at an elevated temperature to effect a separation of the molten by-products from said molten reaction mixture to form a molten by-product-rich upper phase and a molten reactant-rich lower phase in said reaction zone;
withdrawing at least a portion of said molten by-product-rich upper phase; and
recovering at least a portion of the gaseous products formed within said reaction zone.

4,125,591

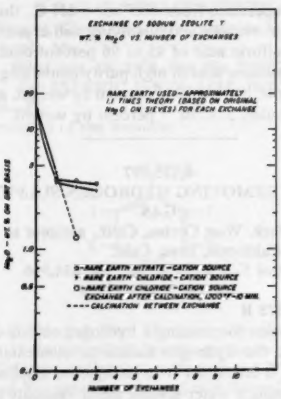
PROCESS FOR PRODUCING RARE EARTH EXCHANGED CRYSTALLINE ALUMINOSILICATE

John F. Lindsley, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 234,984, Mar. 15, 1972, abandoned, which is a continuation-in-part of Ser. No. 837,501, Jun. 30, 1969, abandoned, which is a continuation-in-part of Ser. No. 506,857, Nov. 8, 1965, abandoned, and Ser. No. 506,859, Nov. 8, 1965, abandoned. This application Dec. 13, 1973, Ser. No. 424,386

Int. Cl.[2] C01B *33/28*

U.S. Cl. 423—328 **2 Claims**


EXCHANGE OF SODIUM ZEOLITE Y
WT. % Na2O VS. NUMBER OF EXCHANGES
RARE EARTH USED—APPROXIMATELY 1.1 TIMES THEORY (BASED ON ORIGINAL Na2O ON SIEVES) FOR EACH EXCHANGE
Na2O — WT. % ON DRY BASIS
O—RARE EARTH NITRATE—CATION SOURCE
Y—RARE EARTH CHLORIDE—CATION SOURCE
□—RARE EARTH CHLORIDE—CATION SOURCE EXCHANGE AFTER CALCINATION, 1000°F—10 MIN.
---- CALCINATION BETWEEN EXCHANGE
NUMBER OF EXCHANGES

1. A process for producing rare earth exchange zeolite Y of improved activity and stability which comprises treating an aqueous solution of rare earth metal salt wherein the cations consist essentially of rare earth metal cations so as to obtain a partial exchange of alkali metal cations by rare earth metal cations such that the alkali metal content of zeolite Y is in the range of 3 to 4%, said percentage based on the dry weight of zeolite; calcining the resultant partially exchanged zeolite by heating the same to a temperature above about 450° C. to provide a dehydrated zeolite characterized by the same spatial relationship and unit cell size as the zeolite prior to calcination and treating the resultant calcined partially exchanged zeolite with a second aqueous solution containing rare earth metal cations to reduce further the alkali metal content of said zeolite.

4,125,592

METHOD OF FORMING A SILICON NITRIDE ARTICLE

Andre Ezis, Grosse Ile, Mich., and John J. Schuldies, Phoenix, Ariz., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 710,822, Aug. 2, 1976, abandoned. This application Dec. 9, 1977, Ser. No. 859,500

Int. Cl.[2] C01B *21/06*

U.S. Cl. 423—344 **6 Claims**

1. A method of forming a silicon nitride article which comprises:
forming a silicon particle compact, said compact being less than full density whereby said compact has at least a degree of porosity to permit nitrogen gas to come into the vicinity of all the silicon particles contained therein;
placing said compact in a nitrogen gas containing environment;
heating said compact to a temperature just below a significant reaction temperature at which silicon reacts with nitrogen gas at a measurable rate to form silicon nitride said significant reaction temperature being 1800° F.;
selectively heating only a portion of the surface area of said compact to a temperature above said significant reaction temperature, but below 2600° F. said selective heating being carried out in a manner such that the bulk of said compact at least initially remains at a temperature below said significant reaction temperature whereby the silicon, nitrogen reaction takes place at a measurable rate only in said selectively heated area;
increasing the temperature of said selectively heated portion of the surface area of said compact so that the temperature of adjacent portions of the compact moving into the bulk of the compact from the surface area are heated to a temperature above said significant reaction temperature whereby the reaction of silicon and nitrogen progresses into the bulk of the compact; and
continuing the increase of the temperature of said selectively heated portion of said compact in a manner which causes the reaction zone of silicon and nitrogen to progress inwardly from the surface of said compact to the bulk of the article because the temperature along a reaction line from the surface of said compact into the bulk thereof is progressively and gradually raised to a temperature above said significant reaction temperature to effect the nitriding of substantially all of the silicon in said compact.

4,125,593

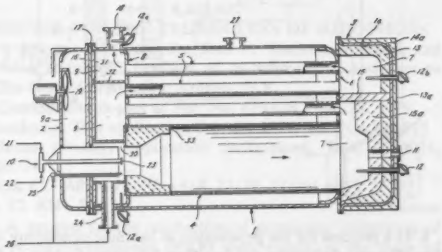
COMBUSTION OF HALOGENATED HYDROCARBONS

John C. Scheifley, Lake Jackson; Clark R. Shields, Angleton, and David E. Busby, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 2, 1976, Ser. No. 710,960

Int. Cl.[2] C01B *7/01;* B01D *53/34*

U.S. Cl. 423—481 **8 Claims**



1. A method for avoiding rapid corrosion of the combustion-tube, tube-sheets, and return-tubes of a water-cooled horizontal fire-tube boiler as a mixture of air, halogenated hydrocarbons, and optional supplemental fuel is burned therein in order

to recover heat values and halogen values from said halogenated hydrocarbons,

and where said fire-tube boiler contains corrosion resistant material on those inner surfaces which are in contact with the hot combustion gases but which are not directly cooled by water on their reverse sides,

said method comprising,

burning a mixture of air, halogenated hydrocarbon and optical supplemental fuel in the combustion chamber of a water-cooled horizontal fire-tube boiler which contains a combustion-tube and a plurality of return-tubes, removing saturated steam from the boiler in the pressure range of about 150 to about 275 psig, while adding water to the boiler at a rate sufficient to keep all the tubes submerged, thereby maintaining the water temperature in the boiler in the temperature range of about 186° C. to about 210° C.,

conveying the combustion gases through an aqueous scrubber to recover halogen values therefrom, and

venting the resulting halogen-depleted gases from the system.

4,125,594

PURIFICATION OF HYDROFLUORIC ACID ETCHING SOLUTIONS WITH WEAK ANION EXCHANGE RESINS

Yao-Sin Su, Corning, and Ken F. Sugawara, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Dec. 22, 1976, Ser. No. 753,420

Int. Cl.[2] C01B *7/22*

U.S. Cl. 423—488 **2 Claims**

1. A method for purifying a spent hydrofluoric acid glass etching solution containing up to about 13% HF by weight and containing fluosilicic acid by removing $SiF_6^=$ ions therefrom which comprises the steps of treating said spent solution with a weak anion exchange resin of the polyamine type in the fluoride salt form to remove said $SiF_6^=$ ions, thereafter regenerating the weak anion exchange resin with an aqueous solution of NaOH and then converting the regenerated weak anion exchange resin back to the fluoride salt from.

4,125,595

PROCESS FOR THE PRODUCTION OF VERY PURE BROMINE

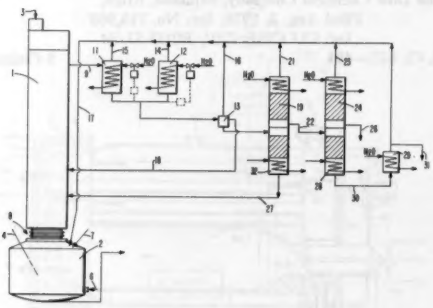
Dietmar Kunze, Sülbergstrasse 1, and Walter Raschka, Wietföhr 53/54, both of 3202 Bad Salzdetfurth, Germany

Filed Sep. 23, 1977, Ser. No. 836,099

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1976, 2643280

Int. Cl.[2] C01B *7/10*

U.S. Cl. 423—500 **6 Claims**



1. In a process for the production of bromine containing less than 90 ppm of chlorine and less than 190 ppm of water and in yields above 99% of theory from heated bromine-containing solution into a bromine column having a reboiler said reboiler having a liquid zone and a gaseous zone, withdrawing a mixture of bromine, chlorine and steam overhead from said bromine column, condensing the mixture of bromine, chlorine and steam withdrawn overhead to form cruse bromine and sour water and distilling the crude bromine so formed, the improvement which comprises:

(a) introducing the chlorine gas into the upper two thirds of the liquie zone in said reboiler, the amount of chlorine gas introduced being controlled as a function of the density of the crude bromine;

(b) introducing about 40% to about 80% of the theoretically needed steam into the lower third of the liquid zone in said reboiler; and,

(c) introducing the remainder of the theoretically needed amount of steam into the gaseous zone of the reboiler or the lower part of the bromine column, the amount of steam introduced being controlled as a function of the temperature of the bromine-chlorine-steam mixture which is withdrawn overhead from the bromine column.

4,125,596

METHOD OF PRODUCING SULPHURIC ACID

Evgeny A. Ryabenko, B. Cheremushkinskaya ulitsa, 2 korpus 2, kv. 26.; Grigory Z. Bljum, ulitsa Kominterna, 32/5, kv. 23.; Tatyana B. Naida, Anadyrsky proezd, 17/1, kv. 65; Alexandr E. Golub, shosse Entuziastov, 212, korpus 5, kv. 134; Natalya I. Galchina, Rusakovskaya ulitsa, 6, kv. 65; Alexandr R. Aronov, Veshnyakovskaya ulitsa, 6, korpus 3, kv. 71; Natalya F. Semenova, Veshnyakovskaya ulitsa, 35/26, kv. 23; Ljudmila K. Raginskaya, ulitsa Marshala Vershinina, 4, korpus 2, kv. 8, and Alexandr M. Vonsovsky, Oktyabrskaya ulitsa, 68, kv. 16, all of Moscow, U.S.S.R.

Filed Apr. 19, 1977, Ser. No. 788,904

Int. Cl.[2] C01B *17/72, 17/90;* B01D *7/00*

U.S. Cl. 423—522 **2 Claims**

1. Method of producing sulfuric acid of high purity, which comprises distilling sulfur trioxide, subjecting the thus distilled sulfur trioxide to sublimation condensation by cooling with a coolant at a temperature from − 5° to − 15° C., thus forming crystals of sulfur trioxide, and dissolving said crystals of sulfur trioxide with sulfuric acid of 95 to 96 percent concentration, thus obtaining sulfuric acid of high purity containing cations in the range of about 10^{-7} to 10^{-8} percent by weight, and anions, $SO_3^=$ in particular, 5×10^{-5} percent by weight.

4,125,597

METHOD OF REMOVING HYDROGEN SULFIDE FROM GAS

Raymond N. Fleck, West Covina, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Feb. 4, 1976, Ser. No. 654,996

Int. Cl.[2] C01B *17/04*

U.S. Cl. 423—573 R **10 Claims**

1. In the process for treating a hydrogen sulfide-containing gas to convert the hydrogen sulfide to elemental sulfur in which said gas is contacted with an aqueous alkaline washing solution containing a water-soluble metal vanadate to yield an effluent gas of reduced sulfur content, the solution is thereafter regenerated by contact with an oxygen-containing gas, elemental sulfur is recovered from said solution, and said regenerated solution is recycled to said gas contacting step, the improvement which comprises:

cocurrently contacting said hydrogen sulfide-containing gas and said washing solution in a series of fluid flow connected stages including at least a primary stage and a final stage, each of said stages comprising a gas-liquid scrubber adapted for cocurrent fluid flow therethrough;

said hydrogen sulfide-containing gas being introduced at said primary stage for sequential flow through said stages to exhaust from said final stage; and

said washing solution being introduced at said final stage for sequential flow through said stages to recovery from said primary stage.

4,125,598

METHOD FOR HEAVY-WATER PRODUCTION BY H_2S-H_2O CHEMICAL EXCHANGE PROCESS

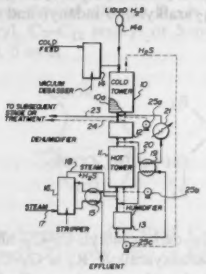
Graeme G. Strathdee, Pinawa, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Sep. 7, 1976, Ser. No. 721,113

Claims priority, application Canada, Dec. 19, 1975, 242154

Int. Cl.[2] C01B *5/00*

U.S. Cl. 423—580 **1 Claim**



1. A method of operation of a stage in a bithermal H_2S gas - H_2O liquid isotope exchange process having hot and cold exchange regions incorporating separation units, with the H_2S gas and the H_2O liquid passing in counter-current isotope exchange relationship through the separation units in the regions, comprising operating the stage such that H_2S in the liquid phase is formed and is maintained in the separation units, the proportion of H_2S liquid to H_2O liquid in the separation units being about 1 percent.

4,125,599

X-RAY CONTRAST AGENTS

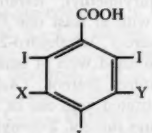
Philip E. Wiegert, Glens Falls, N.Y., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Aug. 19, 1976, Ser. No. 715,974

Int. Cl.[2] C07C *103/24;* **A61K** *29/02*

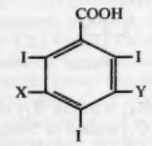
U.S. Cl. 424—5 **7 Claims**

1. A compound of the formula:



wherein X is selected from the group consisting of lower acylamino, N-(lower alkyl)-lower acylamino, N-(hydroxy lower alkyl)-lower acylamino, carbamyl and N-(lower alkyl) carbamyl and Y is gluconamido, and salts thereof with pharmaceutically acceptable cations, and esters thereof with lower alkanols.

6. An x-ray contrast medium comprising an aqueous solution of an effective amount of a salt of a compound of the formula:



wherein X is selected from the group consisting of lower acylamino, N-(lower alkyl)-lower acylamino, N-(hydroxy lower alkyl)-lower acylamino, carbamyl and N-(lower alkyl) carbamyl and Y is gluconamido, with at least one pharmaceutically acceptable cation.

4,125,600

ANTIPERSPIRANT COMPOSITIONS

Martin Callingham, London, England, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 325,290, Jan. 22, 1973, abandoned. This application Aug. 9, 1974, Ser. No. 496,227

Claims priority, application United Kingdom, Jan. 28, 1972, 4182/72

Int. Cl.[2] A61K *7/38*

U.S. Cl. 424—47 **7 Claims**

1. An aerosol antiperspirant composition comprising

(a) from 0.2 to 20% by weight of finely-divided astringent metal salt antiperspirant agent;

(b) a liquid comprising hexylene glycol and a hydrocarbon or halogenated hydrocarbon aerosol propellant, said finely-divided astringent metal salt being dispersed in said liquid;

(c) wherein the improvement comprises a base in an amount effective to prevent development of off-odors from said hexylene glycol; the ratio of base to antiperspirant agent being in the range of from about 1:20 to 1:100.

4,125,601

SUBSTITUTED NITROAMINOPHENOLS, PROCESS FOR THEIR PREPARATION AND DYEING COMPOSITIONS IN WHICH THEY ARE PRESENT

Andree Bugaut, Boulogne, and Monique Andrillon, Aulnay-sous-Bois, both of France, assignors to L'Oreal, Paris, France

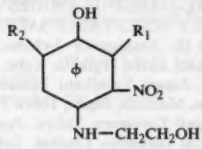
Filed Apr. 20, 1977, Ser. No. 789,444

Claims priority, application Luxembourg, Apr. 21, 1976, 74807

Int. Cl.[2] A61K *7/09, 7/13;* **C07C** *91/06*

U.S. Cl. 424—71 **21 Claims**

1. A dye compound having the formula



(I)

in which R_1 and R_2 are identical or different and represent hydrogen or alkyl having from 1 to 4 carbon atoms.

2. Dyeing composition for keratin fibres and human hair, which comprises, in aqueous solution, at least one dye compound of claim 1.

4,125,602

PROCESS FOR THE PRODUCTION OF IODOPHORS

Kaya Atasoy, Munchenstein; Karl F. Weckwarth, Basel, and Walter Reinhardt, Pratteln, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 635,028, Nov. 25, 1975, abandoned. This application Sep. 20, 1977, Ser. No. 835,075

Claims priority, application Switzerland, Dec. 2, 1974, 15955/74

Int. Cl.[2] A01N *11/00;* **A61K** *31/79, 33/18;* **A61L** *13/00*

U.S. Cl. 424—80 **14 Claims**

1. A process for the production of germicidal complexes of poly-N-vinylpyrrolidone (PVP) with iodine, in the form of granules having a particle size of 10μ - 3 mm said granules having weight ratio of iodide ions to iodine of from 0.2:1 to 5:1 and a weight ratio of PVP to iodine of from 1:1 to 20:1, which process comprises the steps of:

(a) producing a solution or colloidal suspension of (i) ele-

mentary iodine and (ii) hydriodic acid or a salt releasing iodide ions in a first solvent or solvent mixture,

(b) producing a solution or colloidal suspension of PVP in a second solvent or solvent mixture (i) which has a surface tension different from the surface tension of the first solvent or solvent mixture, (ii) in which PVP is at least partially soluble or wettable, and (iii) in which the iodine and the salt dissolved or suspended in the first solvent or solvent mixture are insoluble or only slightly soluble;

(c) combining the solutions or suspensions (a) and (b), with uniform thorough mixing, in small portions to form a mixed-phase system;

(d) continuing the thorough mixing for sufficient time to form a multiphase mixture with floating agglomerates containing iodine/PVP complex and iodide ions, and

(e) separating and drying said agglomerates.

4,125,603

STABILIZED WATER-IN-OIL EMULSIONS AND COMPOSITIONS

Francoise Audibert, Neuilly-sur-Seine; Edgar Lederer, Sceaux, and Louis Chedid, Paris, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Feb. 9, 1976, Ser. No. 656,738

Claims priority, application France, Feb. 7, 1975, 75 04003

Int. Cl.[2] **A61K** *39/02, 39/04, 47/00*

U.S. Cl. 424—88 **32 Claims**

1. A stable, injectable, liquid composition for use in medical therapy of a water-in-oil emulsion of a metabolizable vegetable oil and water, the emulsion containing less water than oil and a non-immunogenic stabilizing protein in a quantity suitable to ensure the stability of the emulsion, which protein is non-toxic and metabolizable.

4,125,604

N2-ARYLSULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto, 15-18, Asahigaoka 3-chome, Tarumi-ku, Kobe-shi, Hyogo, Japan; Akiko Hijikata, Kobe, Japan; Ryoji Kikumoto, Machida, Japan; Yoshikuni Tamao, Yokohama, Japan; Kazuo Ohkubo, Machida, Japan; Tohru Tezuka, Yokohama, Japan, and Shinji Tonomura, Tokyo, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Shosuke Okamoto, Hyogo, both of, Japan

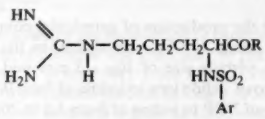
Continuation-in-part of Ser. No. 653,217, Jan. 28, 1976, Pat. No. 4,055,651, and Ser. No. 713,486, Aug. 11, 1976, Pat. No. 4,073,914, and Ser. No. 723,474, Sep. 14, 1976, Pat. No. 4,096,235, and Ser. No. 728,051, Sep. 30, 1976, and Ser. No. 760,929, Jan. 19, 1977, and Ser. No. 760,672, Jan. 19, 1977, Pat. No. 4,093,712, and Ser. No. 760,745, Jan. 19, 1977, Pat. No. 4,066,773, and Ser. No. 760,668, Jan. 19, 1977, and Ser. No. 760,676, Jan. 19, 1977. This application Jun. 7, 1977, Ser. No. 804,334

The portion of the term of this patent subsequent to Oct. 25, 1994, has been disclaimed.

Int. Cl.[2] **A61K** *37/00;* **C07C** *103/52*

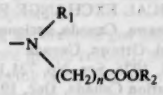
U.S. Cl. 424—177 **4 Claims**

1. An N^2-arylsulfonyl-L-argininamide of the formula (I) having the D-configuration in the carbon atom to which the carboxyl group or the ester thereof is attached:



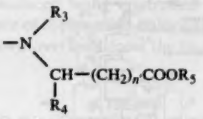
(I)

or a pharmaceutically acceptable salt thereof, wherein R is



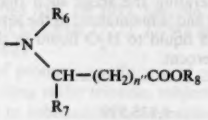
(1)

wherein R_1 is C_2–C_{10} carboxyalkyl, C_3–C_{10} akoxycarbonylalkyl or C_8–C_{15} α-carboxyaralkyl; R_2 is hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl or 5-indanyl; and n is an integer of 1, 2 or 3,



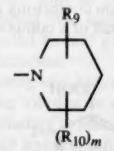
(2)

wherein R_3 is C_2–C_{10} carboxyalkyl, C_3–C_{10} alkoxycarbonylalkyl or C_8–C_{15} α-carboxyaralkyl; R_4 is C_1–C_{10} alkyl, phenyl optionally substituted with at least one C_1–C_5 alkyl, C_1–C_5 alkoxy, or mixtures thereof, C_7–C_{12} aralkyl, or ring substituted benzyl wherein said substituent is C_1–C_5 alkyl or C_1–C_5 alkoxy; R_5 is hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl or 5-indanyl; and n' is an integer of 0, 1 or 2,



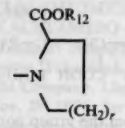
(3)

wherein R_6 is hydrogen, C_1–C_{10} alkyl, C_3–C_{10} alkenyl, C_3–C_{10} alkynyl, C_2–C_{10} alkoxyalkyl, C_2–C_{10} alkylthioalkyl, C_2–C_{10} alkylsulfinylalkyl, C_1–C_{10} hydroxyalkyl, C_3–C_{10} alkylcarbonylalkyl, C_1–C_{10} haloalkyl, C_7–C_{15} aralkyl, C_3–C_{10} cycloalkyl, C_4–C_{10} cycloalkylalkyl, furfuryl, tetrahydrofurfuryl optionally substituted with at least one C_1–C_5 alkyl, C_1–C_5 alkoxy or mixtures thereof, 3-furylmethyl, tetrahydro-3-furylmethyl optionally substituted with at least one C_1–C_5 alkyl, C_1–C_5 alkoxy or mixtures thereof, tetrahydro-2 (3 or 4)-pyranylmethyl optionally substituted with at least one C_1–C_5 alkyl, C_1–C_5 alkoxy or mixtures thereof, 1,4-dioxa-2-cyclohexylmethyl optionally substituted with one or more C_1–C_5 alkyl, C_1–C_5 alkoxy or mixtures thereof, 2-thenyl, 3-thenyl, tetrahydro-2-thenyl optionally substituted with at least one C_1–C_5 alkyl, C_1–C_5 alkoxy or mixtures thereof, or tetrahydro-3-thenyl; R_7 is carboxyl or C_2–C_{10} alkoxycarbonyl; R_8 is hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl or 5-indanyl; and n'' is an integer of 0, 1 or 2,



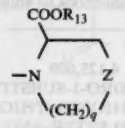
(4)

wherein R_9 is —$COOR_{11}$ wherein R_{11} is hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl or 5-indanyl; each R_{10} independently is hydrogen, C_1–C_{10} alkyl, phenyl, C_1–C_5 alkoxy, C_2–C_6 alkoxycarbonyl or carboxy; m is an integer of 1 to 4; R_9 is substituted at the 2 or 3-position; and R_{10} can be substituted at the 2, 3, 4, 5 or 6-position,



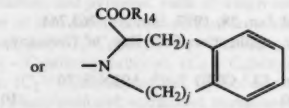
(5)

optionally substituted with at least one C_1–C_5 alkyl, C_1–C_5 alkoxy or mixtures thereof wherein R_{12} is hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl or 5-indanyl; and r is an integer of 1, 3, 4, 5 or 6,



(6)

wherein R_{13} is hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl or 5-indanyl; Z is oxy, thio or sulfinyl; and q is an integer of 0 or 1,



(7)

wherein R_{14} is hydrogen, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–C_{12} aralkyl or 5-indanyl; i is an integer of 0, 1 or 2; j is an integer of 0, 1 or 2; and the sum of $i + j$ is an integer of 1 or 2; and Ar is a phenyl, naphthyl, naphthoquinonyl, anthryl, phenanthryl, pentalenyl, heptalenyl, azulenyl, biphenylenyl, as -indacenyl, S-indacenyl, acenaphthylenyl, phenylcarbonylphenyl, phenoxyphenyl, benzofuranyl, isobenzofuranyl, benzo(b)-thienyl, isobenzothienyl, oxanthrenyl, thianthrenyl, dibenzofuranyl, dibenzothienyl, phenoxathiinyl, indolyl, 1H-indazolyl, quinolyl, isoquinolyl, phthalazinyl, 1,8-naphthyridinyl, quinoxalinyl, quinazolinyl, cinnolinyl, carbazolyl, acridinyl, phenazinyl, phenothiazinyl, phenoxazinyl or benzimidazolyl group each of which is unsubstituted or substituted with one or more groups selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl, C_1–C_{10} alkoxy, C_2–C_{20} dialkylamino, sulfoamino, carbamoyl, C_3–C_{10} N,N-dialkylcarbamoyl, amino, C_1–C_{10} alkylamino, mercapto, C_1–C_{10} alkylthio, C_7–C_{12} aralkyl, carboxyl, C_2–C_{10} alkoxycarbonyl, C_2–C_{10} carboxyalkyl, C_1–C_{10} acylamino, C_2–C_{10} alkylcarbonyl, C_1–C_{10} hydroxyalkyl, C_1–C_{10} haloalkyl, and phenyl optionally substituted with at least one hydroxy, C_1–C_5 alkoxy or mixtures thereof, or a C_9–C_{16} cycloalkylphenyl, C_{10}–C_{18} cycloalkylalkylphenyl, C_9–C_{16} cycloalkoxyphenyl, C_9–C_{16} cycloalkylthiophenyl, 5,6,7,8-tetrahydronaphthyl, C_7–C_{12} aralkyl, 9,10-dihydroanthryl, 5,6,7,8-tetrahydroanthryl, 9,10-dihydrophenanthryl, 1,2,3,4,5,6,7,8-octahydrophenanthryl, indenyl, indanyl, fluorenyl, acenaphthenyl, phenylthiophenyl, 1,2-methylenedioxyphenyl, 1,2-ethylenedioxyphenyl, chromanyl, isochromanyl, 2,3-dihydrobenzofuranyl, 1,3-dihydroisobenzofuranyl, 2,3-ethylenedioxynaphthyl, xanthenyl, thioxanthenyl, 1,2-trimethylenedioxyphenyl, 2H-chromenyl, 3,4-dehydro-1-isochromanyl, 4H-chromenyl, indolinyl, isoindolinyl, 1,2,3,4-tetrahydroquinolyl, or 1,2,3,4-tetrahydroisoquinolyl group each of which is unsubstituted or substituted with one or more groups selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl, C_1–C_{10} alkoxy, C_2–C_{20} dialkylamino, sulfoamino, carbamoyl, C_3–C_{10} N,N-dialkylcarbamoyl, amino, C_1–C_{10} alkylamino, mercapto, C_1–C_{10} alkylthio, C_7–C_{12} aralkyl, C_2–C_{10} alkoxycarbonyl, C_2–C_{10} carboxyalkyl, C_1–C_{10} acylamino, C_2–C_{10} alkylcarbonyl, C_1–C_{10} hydroxyalkyl, C_1–C_{10} haloalkyl, oxo and phenyl optionally substituted with at least one hydroxy, C_1–C_5 alkoxy or mixtures thereof.

4,125,605

METHOD OF EMPLOYING ORAL TRH

John E. Tyson, Reisterstown, Md., assignor to The United States Government, Washington, D.C.

Filed Oct. 19, 1977, Ser. No. 843,367

Int. Cl.[2] A61K *37/00;* **C07C** *103/52*

U.S. Cl. 424—177 **3 Claims**

1. In a method for enhancing lactation in a postpartum woman, the improvement which comprises orally administering to said woman from 5 to 10 mg of TRH twice a day at about 12 hour intervals for a period of approximately 5 days.

4,125,606

OCTAPEPTIDE USEFUL FOR THE TREATMENT OF DIABETES

Joseph Bornstein, Clayton, Australia, assignor to Choay S.A., Paris, France

Filed Dec. 29, 1975, Ser. No. 644,845

Claims priority, application France, Dec. 31, 1974, 74 43513

Int. Cl.[2] A61K *37/00, 37/26;* **C07C** *103/52*

U.S. Cl. 424—178 **16 Claims**

1. Compound constituted by the peptide chain: leucyl - seryl - arginyl - leucyl - phenylalanyl - aspartyl - asparaginyl - alanine (I).

2. A method for the treatment of diabetes by promoting the utilization of insulin which comprises administering to a patient an effective dose of leucyl - seryl - arginyl - leucyl - phenylalanyl - aspartyl - asparaginyl - alanine (I).

4,125,607

DAUNOSAMINYL ANTHRACYCLINONES AND THEIR USE

Federico Arcamone; Luigi Bernardi; Pietro Giardino, and Aurelio di Marco, all of Milan, Italy, assignors to Societa' Farmaceutici Italia S.p.A., Milan, Italy

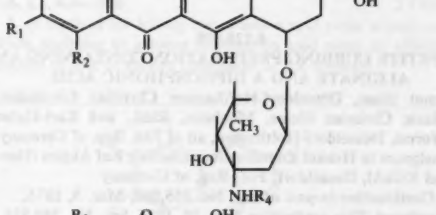
Filed Nov. 1, 1976, Ser. No. 737,473

Claims priority, application United Kingdom, Nov. 18, 1975, 47559/75

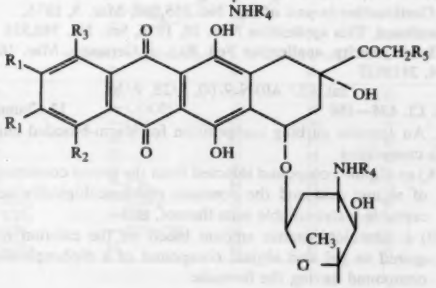
Int. Cl.[2] C07H *15/24*

U.S. Cl. 424—180 **6 Claims**

1. A compound of the formulae

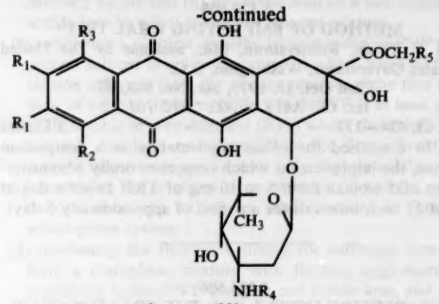


I

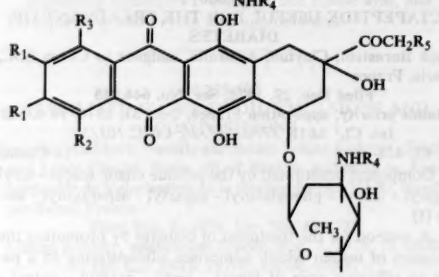


II

-continued



III



IV

wherein when

R_1 is hydrogen, R_2 and R_3 are both hydrogen, methyl, methoxy, chlorine or bromine; when

R_2 and R_3 are both hydrogen, R_1 is hydrogen, methyl, methoxy, chlorine or bromine;

R_4 is hydrogen or trifluoroacetyl; and

R_5 is OH, $OCOR_6$, $OCOCH_2OCOR_6$ or NR_7R_8, wherein R_6 is an alkyl having from 6 to 16 carbon atoms, and R_7 and R_8 are each a lower alkyl group having 1 to 6 carbon atoms or are part of a cyclic structure of the formula: $-(CH_2)_4-$, $-(CH_2)_5-$, $-(CH_2)_2-O-(CH_2)_2-$ or $-(CH_2)_2-NCH_3-(CH_2)_2-$ with the proviso that when R_5 is OH, each of R_1, R_2, R_3 and R_4 is hydrogen.

6. A method of inhibiting the growth of Sarcoma 180 ascites which comprises administering to a host afflicted therewith, an amount of a compound according to claim 1 sufficient to inhibit the growth thereof.

4,125,608

APPETITE CURBING PREPARATION CONTAINING AN ALGINATE AND A DIPHOSPHONIC ACID

Helmut Blum, Düsseldorf-Holthausen; Christian Gloxhuber, Haan; Christian Heine, Monheim, Rhld., and Karl-Heinz Worms, Düsseldorf-Holthausen, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft Auf Aktien (Henkel KGaA), Dusseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 555,062, Mar. 3, 1975, abandoned. This application Nov. 10, 1976, Ser. No. 740,531

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1974, 2412827

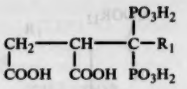
Int. Cl.[2] A01N *9/00, 9/28, 9/36*

U.S. Cl. 424—180 **12 Claims**

1. An appetite curbing composition for warm-blooded animals comprising

(A) an alginic compound selected from the group consisting of alginic acid and the nontoxic pharmacologically acceptable water-soluble salts thereof, and

(B) a substoichiometric amount based on the calcium required to gel said alginic compound of a diphosphonic compound having the formula:



wherein R_1 is selected from the group consisting of hydrogen and methyl; or the nontoxic pharmacologically acceptable water-soluble salts thereof, the weight of said diphosphonic compound being 0.5% to 2% of the weight of said alginic compound and the amount of said diphosphonic compound being sufficient to inhibit precipitation of calcium alginate when said alginate is administered to animals.

4,125,609

O-ALKYL-O-[1,6-DIHYDRO-1-SUBSTITUTED-6-THIOXOPYRIDAZIN(3)YL]-(THIONO) (THIOL) PHOSPHORIC (PHOSPHONIC) ACID ESTER AND ESTERAMIDES

Wolfgang Hofer; Fritz Maurer; Hans-Jochem Riebel, all of Wuppertal; Ingeborg Hammann, Cologne; Wolfgang Behrenz, Overath, and Bernhard Homeyer, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

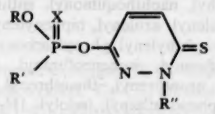
Filed Jan. 28, 1977, Ser. No. 763,741

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1976, 2603993

Int. Cl.[2] C07D *9/65;* **A01N** *9/36*

U.S. Cl. 424—200 **10 Claims**

1. An O-alkyl-O-[1,6-dihydro-1-substituted-6-thioxopyridazin(3)yl]-(thiono)(thiol) phosphoric (phosphonic) acid ester or ester-amide of the formula



in which

R is alkyl with 1 to 6 carbon atoms,

R′ is alkyl, alkoxy, alkylmercapto or alkylamino with 1 to 6 carbon atoms per alkyl chain, or phenyl,

R″ is alkyl, cyanoalkyl, carbalkoxyalkyl or alkylcarbonylalkyl with 1 to 4 carbon atoms per alkyl chain, phenyl or phenyl carrying at least one substituent selected from the group consisting of halogen, nitro, alkyl with 1 to 4 carbon atoms and halogenoalkyl with 1 to 4 carbon atoms, and

X is oxygen or sulfur.

9. A method of combating insects and acarids which comprises applying to the insects, acarids, or to a habitat thereof, an insecticidally or acaracidally effective amount of a compound according to claim 1.

4,125,610

ANTIBACTERIAL COMPOSITIONS

George Redl, Williamsville, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

Filed Jul. 27, 1977, Ser. No. 819,523

Int. Cl.[2] A61K *31/66, 31/505*

U.S. Cl. 424—211 **9 Claims**

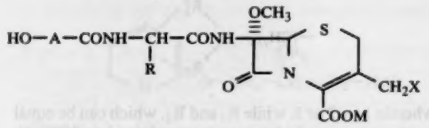
6. A method of treating a warm-blooded animal afflicted with a bacterial disease which comprises orally administering to said warm-blooded animal an antibacterially effective amount of a composition comprising from about 0.25 to about 20 parts of phosphanilic acid or a pharmaceutically acceptable salt thereof and one part of trimethoprim or a pharmaceutically acceptable salt thereof.

4,125,611
3-HETEROCYCLIC THIOMETHYL 7-METHOXY-7 SUBSTITUTED ACETAMIDO CEPHALOSPORINS

Hirotada Yamade; Takenari Nakagome, both of Nishinomiya, and Toshiaki Komatsu, Takarazuk, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 29, 1976, Ser. No. 745,749
Claims priority, application Japan, Nov. 28, 1975, 50/142647
Int. Cl.[2] C07D *501/36*
U.S. Cl. 424—246 **14 Claims**

1. A cephalosporin of the formula (I):



(I)

wherein A is a heteroaromatic ring selected from the group consisting of quinoline, isoquinoline, cinnoline, naphthyridine, quinoxaline, pyrazolopyridine, pyridopyrazine, thiazolopyrimidine, pyridopyrimidine, pyrimidinopyridazine, thienopyridine, thiazolopyridine, pyridine, pyrimidine, pyridazine, triazine, and pyrazine, each of which may be substituted with one or two substituents selected from the group consisting of halogen, (C_1-C_4)alkyl, (C_1 - C_4)alkoxy, (C_2 - C_5)alkanoyl, (C_2 - C_5)alkoxycarbonyl, (C_1 - C_4)alkylthio, mercapto, hydroxy, (C_2 - C_5)alkoxymethyl, cyano, nitro, (C_1 - C_4)alkylsulfonyl, phenylsulfonyl, sulfamoyl, carbamoyl, phenyloxycarbonylamino, acetoacetylamino, (C_1 - C_4)alkylamino, di-(C_1 - C_4)alkylamino, halo-(C_1 - C_4)alkyl, (C_2 - C_5)alkenyl, phenyl, (C_3 - C_6)cycloalkyl, (C_4 - C_6)cycloalkylene, piperazino, piperidino, pyrrolidino, and morpholino; R is a phenyl group which may be unsubstituted or substituted with up to three chemically compatible substituents selected from the group consisting of nitro, di-(C_1 - C_4)alkylamino, (C_2 - C_5)alkanoylamino, (C_1 - C_4)alkylsulfonamino, amino hydroxy, (C_2 - C_5)alkanoyloxy, (C_1 - C_4)alkyl, (C_1 - C_4)alkoxy, chloro, bromo, fluoro, iodo, trifluoromethyl, hydroxymethyl, ureido or sulfamyl; a thienyl group; a furyl group; a cyclohexadienyl group or a cyclohexenyl group; X is

-S-Het

in which Het is tetrazolyl, thiadiazolyl, triazolyl, oxadiazolyl, pyridazinyl, tetrazolo-[4,5-b]pyridazinyl, pyridazino[3,2-c]-S-triazolyl or pyridazino-[2,1-c]-S-triazolyl, each of which may be unsubstituted or substituted with 1 or 2 substituents selected from the group consisting of (C_1 - C_4)alkyl, (C_1 - C_4)alkoxy, hydroxy, mercapto, hydroxymethyl, aminomethyl and methylamino; and M is a hydrogen atom or a biologically active carbonyl-protecting group, and the non-toxic pharmaceutically acceptable salts thereof.

13. An antimicrobial composition which comprises an antimicrobially effective amount of at least one compound of the formula (I) of claim **1** as an active ingredient and a pharmaceutically acceptable carrier or diluent.

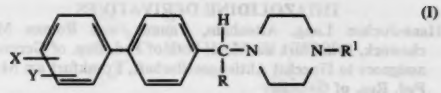
14. A method of treating or preventing infectious diseases caused by Gram-positive or Gram-negative bacteria in an animal which comprises administering an antimicrobially effective amount of at least one compound of the formula (I) of claim **1** to said animal.

4,125,612
N-1-(P-BIPHENYLALKYL)PIPERAZINES AND THEIR USE AS ANTI-INFLAMMATORY AGENTS

Margaret H. Sherlock, Bloomfield, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Filed Jun. 20, 1977, Ser. No. 807,846
Int. Cl.[2] A61K *31/495;* **C07D** *295/18, 295/14, 295/08*
U.S. Cl. 424—250 **14 Claims**

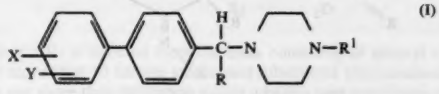
1. A compound of the formula:



(I)

or the pharmaceutically acceptable acid addition salts thereof, wherein X is halogeno, difluoromethyl or trifluoromethyl, Y is hydrogen, halogeno, difluoromethyl, or trifluoromethyl, R is lower alkyl, R^1 is hydrogen, carboloweralkoxy, hydroxyloweralkyl, loweralkoxyloweralkyl, acyl or acyloxyloweralkyl, said acyl moieties being derived from monobasic carboxylic acids having up to 14 carbon atoms.

14. A method for treating inflammation which comprises administering to a mammal suffering from inflammation a therapeutically effective quantity of a compound of the formula:



(I)

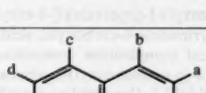
and the therapeutically acceptable acid addition salts thereof wherein X is halogeno, difluoromethyl or trifluoromethyl, Y is hydrogen, halogeno, difluoromethyl, or trifluoromethyl, R is lower alkyl, R^1 is hydrogen, formyl, carboloweralkoxy, hydroxyloweralkyl, loweralkoxyloweralkyl, acyl or acyloxyloweralkyl, said acyl moieties being derived from monobasic carboxylic acids having up to 14 carbon atoms.

4,125,613
PESTICIDAL CINNOLINES

John S. Badmin, Isle of Sheppey, and Richard F. Jones, Faversham, both of England, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 6, 1978, Ser. No. 867,419
Claims priority, application United Kingdom, Jan. 10, 1977, 718/77
Int. Cl.[2] A61K *31/495*
U.S. Cl. 424—250 **2 Claims**

1. A method for killing insect and acarid pests which comprises applying to a locus infested by said pests an effective amount of one of eleven cinnolines of the formula



(I)

wherein, respectively, a, b, c, d, and e are:

a	b	c	d	e
H	H	H	H	H
H	—COOH	H	H	H
H	—OH	H	Br	H
Br	H	H	H	H
H	H	H	H	Cl
H	H	Cl	H	H
H	$-CH_3$	H	H	H
$-CH_3$	$-C_2H_5$	H	H	H
$-CH_3$	—OH	H	H	H
$-CH_3$	$-COOCH_3$	H	H	H
$-CH_3$	H	H	H	H

4,125,614
THIAZOLIDINE DERIVATIVES

Hans-Jochen Lang, Altenhain, Taunus, and Roman Muschaweck, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

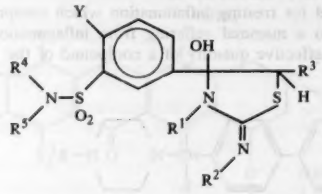
Division of Ser. No. 599,103, Jul. 25, 1975, Pat. No. 4,061,761. This application Apr. 19, 1977, Ser. No. 788,905

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1974, 2436263

Int. Cl.[2] **C07D** *239/70;* **A61K** *31/425*

U.S. Cl. 424—251 **10 Claims**

1. A thiazolidine compound of the formula



or an acid addition salt thereof with a pharmaceutically acceptable acid, wherein R^1 and R^2, taken together, are alkylene having 2 to 4 carbon atoms; R^3 is hydrogen or alkyl having 1 to 2 carbon atoms; R^5 is hydrogen and R^4 is hydrogen, alkyl, or alkenyl having up to 6 carbon atoms, or such alkyl or alkenyl which is substituted by alkoxy having 1 to 4 carbon atoms, or R^5 is hydrogen and R^4 is cycloalkyl having 3, 5, or 6 carbon atoms, cyclohexylmethyl, phenyl, phenylalkyl having 1 to 3 carbon atoms in the alkyl moiety, or such phenylalkyl the phenyl ring of which is substituted by one or two halogen atoms, by one to three methoxy groups, by one alkyl group, or by one methylenedioxy group, or R^4 and R^5 are each methyl; and Y is hydrogen, halogen, methyl or trifluoromethyl.

7. The method of inducing salidiuresis in a patient which comprises administering to said patient a salidiuretically effective amount of a compound as in claim **1**.

4,125,615
2-[4-(p-AMINOBENZYL)-1-PIPERAZINYL]-8-ETHYL-5,8-DIHYDRO-5-OXOPYRIDO[2,3-d]PYRIMIDINE-6-CARBOXYLIC ACID, ITS PHARMACEUTICALLY ACCEPTABLE SALT, PROCESS FOR ITS PRODUCTION AND USE THEREOF

Jun-ichi Matsumoto, Takatsuki, Japan, assignor to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jul. 20, 1977, Ser. No. 817,539

Claims priority, application Japan, Jul. 22, 1976, 51-87929

Int. Cl.[2] **A61K** *31/505;* **C07D** *401/14*

U.S. Cl. 424—251 **4 Claims**

1. 2-[4-(p-Aminobenzyl)-1-piperazinyl]-8-ethyl-5,8-dihydro-5-oxopyrido-[2,3-d]pyrimidine-6-carboxylic acid.

3. A pharmaceutical composition comprising from 10 to 60% by weight of 2-[4-(p-aminobenzyl)-1-piperazinyl]-8-ethyl-5,8-dihydro-5-oxopyrido[2,3-d]pyrimidine-6-carboxylic acid or a pharmaceutically acceptable salt thereof in admixture with a pharmaceutically acceptable carrier.

4,125,616
PYRIDOXYLIDINE AMINO BENZOATE COMPOUNDS

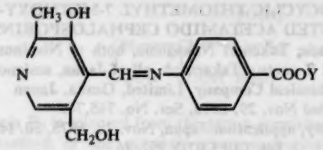
Luigi Molteni, Malnate, Varese, Italy; Jose A. Ramirez Fernandez, Madrid, Spain; Franco Scrollini, Voghera, and Giampiero Vercesi, Rho, Milan, both of Italy, assignors to Zambeletti Espana, S.A., Madrid, Spain

Continuation of Ser. No. 628,711, Nov. 4, 1975, abandoned. This application Jan. 21, 1977, Ser. No. 761,050

Int. Cl.[2] **A61K** *31/44, 31/525;* **C07D** *213/10, 413/12*

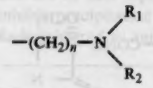
U.S. Cl. 424—263 **3 Claims**

1. Pyridoxin derivatives of the general formula I:



(I)

wherein Y represents a



group wherein $n = 2$ or 3, while R_1 and R_2, which can be equal or different, represent alkyl groups having from 1 to 5 carbon atoms either straight or branched chain, or cycloalkyl residues with 5 or 6 members or joined to the nitrogen atom form a ring with 5 or 6 members which optionally comprise one oxygen atom, and their non-toxic salts with organic and inorganic acids.

2. Di-ethyl-amino-ethyl pyridoxylidene aminobenzoate HCl.

3. A pharmaceutical composition for use as an antineuritic and analgesic drug comprising as active principle the compound of claim **2**, in association with a pharmaceutically acceptable carrier, the amount of the active principle being effective for use as an antineuritic or analgesic drug.

4,125,617
ACARICIDAL PYRIDINIUM SALTS

John H. Parsons, Saffron Walden, England, assignor to Fisons Limited, London, United Kingdom

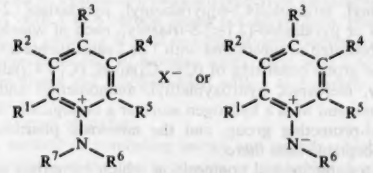
Division of Ser. No. 545,700, Jan. 30, 1975, Pat. No. 4,025,632, which is a division of Ser. No. 321,476, Jan. 5, 1973, Pat. No. 3,886,171. This application Mar. 23, 1977, Ser. No. 780,348

Claims priority, application United Kingdom, Jan. 5, 1972, 369/72

Int. Cl.[2] **A01N** *9/22*

U.S. Cl. 424—263 **16 Claims**

1. An acaricidal composition containing as the active ingredient an acaricical amount of a compound of the formula



(I) (II)

in which R^1, R^2, R^3, R^4 and R^5 are the same or different and each represents hydrogen or alkyl of 1 to 4 carbon atoms;

R^6 represents a group of formula COR^{10}, $COOR^{11}$, or $CONR^{13}R^{14}$ in which R^{10} represents styryl; styryl substituted by halogen; furyl; pyridyl; benzofuryl or thienyl; R^{11} represents phenyl; phenyl substituted by halogen or alkyl of 1 to 4 carbon atoms; phenyl substituted by halogen and alkyl of 1 to 4 carbon atoms; or benzofuryl; R^{13} represents alkyl of 1 to 8 carbon atoms; phenyl; or phenyl substituted by one or more groups selected from halogen; alkyl of 1 to 4 carbon atoms and alkoxy of 1 to 4 carbon atoms; and R^{14} represents hydrogen or alkyl of 1 to 8 carbon atoms;

R^7 represents hydrogen, alkyl of 1 to 4 carbon atoms or benzoyl substituted by halogen; and

X^- represents one equivalent of an anion, and

an acaricidally acceptable carrier therefor.

4,125,618

NOVEL SUBSTITUTED PYRIDINES, THEIR PREPARATION AND PHARMACEUTICAL USE

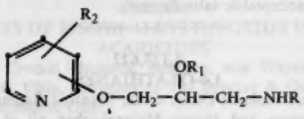
John J. Baldwin, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 696,237, Jun. 15, 1976, Pat. No. 4,060,601. This application Mar. 7, 1977, Ser. No. 774,847

Int. Cl.[2] C07D *213/64, 213/65;* A61K *31/44*

U.S. Cl. 424—265 **20 Claims**

1. Compound having the formula



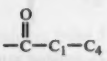
wherein

R is C_3-C_4 branched alkyl

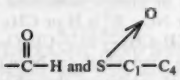
R_1 is

wherein L is selected from C_1-C_{10} alkyl, phenyl and mono- and di- substituted phenyl wherein the substituents are independently selected from C_1-C_4 alkoxy, halo and C_1-C_4 alkyl, and

R_2 is selected from trihalomethyl,



alkyl,



alkyl and pharmaceutically acceptable salts thereof.

16. A method of treating hypertension in animals which comprises administering an effective amount of a compound of claim 1.

4,125,619

N^2-NAPHTHALENESULFONYL-L-ARGININE DERIVATIVES AND THE PHARMACEUTICALLY ACCEPTABLE ACID ADDITION SALTS THEREOF

Shosuke Okamoto, 15-1i, Asahigaoka-chome, Tarumi-ku, Kobe-shi, Hyogo, Japan; Ryoji Kikumoto, Tokyo, Japan; Kazuo Ohkubo, Machida, Japan; Tohru Tezuka, Yokohoma, Japan; Shinji Tonomura, Tokyo, Japan; Yoshikuni Tamao, Yokohama, Japan, and Akiko Hijikata, Kobe, Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo and Shosuke Okamoto, Hyogo, both of, Japan

Continuation-in-part of Ser. No. 671,568, Mar. 29, 1976, Pat. No. 4,049,645, which is a continuation-in-part of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,673

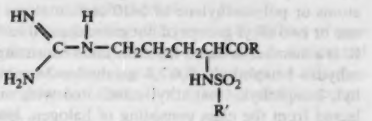
Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-023268; Feb. 26, 1975, 50-023635; Mar. 5, 1975, 50-026768; Mar. 11, 1975, 50-029357; Mar. 11, 1975, 50-029358

The portion of the term of this patent subsequent to Dec. 20, 1994, has been disclaimed.

Int. Cl.[2] A61K *31/445;* C07D *211/16*

U.S. Cl. 424—267 **11 Claims**

1. N^2-naphthalenesulfonyl-L-arginine esters and amides having the formula



or the acid addition salts thereof with a pharmaceutically acceptable acid wherein R is selected from the class consisting of (1) alkoxy, alkenyloxy, alkynyloxy and cycloalkoxy, respectively containing not more than 10 carbon atoms, aralkyloxy of not more than 15 carbon atoms, tetrahydrofurfuryloxy, and alkoxy of not more than 10 carbon atoms substituted with an alkoxy group of not more than 10 carbon atoms, halogen or nitro; (2)

wherein R_1 is selected from the class consisting of alkenyl of not more than 10 carbon atoms, and substituted alkyl containing not more than 20 carbon atoms wherein said substituent is a member selected from the class consisting of alkoxy, alkoxycarbonyl, arylcarbamoyl, acyl, acyloxy, N,N-polymethylenecarbamoyl and carboxy; and R_2 is selected from the class consisting of hydrogen, alkyl and alkenyl, respectively containing not more than 10 carbon atoms; and substituted alkyl containing not more than 20 carbon atoms wherein said substituent is a member selected from the class consisting of alkoxy, alkoxycarbonyl, arylcarbamoyl, acyl, acyloxy, N,N-polymethylenecarbamoyl and carboxy; and (3)

wherein Z is a divalent group containing up to 20 carbon atoms, which consists of more than one group selected from the class consisting of methylene —CH_2—, mono-substituted methylene

wherein R_3 is selected from the class consisting of alkyl, acyl, alkoxy and alkoxycarbonyl, respectively containing not more than 10 carbon atoms, and carbamoyl; and disubstituted methylene

wherein R_4 and R_5 are alkyl groups of not more than 10 carbon atoms, cycloalkylene of not more than 10 carbon atoms, phenylene

and carbonyl

with the proviso that Z is not polymethylene of 3–10 carbon atoms or polymethylene of 3–10 carbon atoms substituted by one or two alkyl groups of not more than 10 carbon atoms and R′ is a member selected from the class consisting of 5,6,7,8-tetrahydro-1-naphthyl, 5,6,7,8-tetrahydro-2-naphthyl, 1-naphthyl, 2-naphthyl, 1-naphthyl substituted with one member selected from the class consisting of halogen, nitro, cyano, hydroxy, alkyl containing not more than 10 carbon atoms, 2-naphthyl substituted with one member selected from the class consisting of halogen, nitro, cyano, hydroxy, alkyl containing not more than 10 carbon atoms.

11. A method of inhibiting activity and suppressing activation of thrombin in vivo which comprises administering to a mammal a pharmaceutically effective amount of a compound of claim **1**.

4,125,620

2-[(2′,6′-DISUBSTITUTED-PHENYL)-IMINO]-IMIDAZOLIDINES AND SALTS THEREOF

Helmut Stahle; Herbert Köppe; Werner Kummer, all of Ingelheim am Rhein, and Wolfgang Hoefke, Budenheim, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

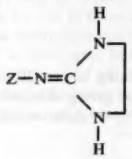
Continuation-in-part of Ser. No. 720,991, Sep. 7, 1976, abandoned, which is a continuation-in-part of Ser. No. 615,930, Sep. 23, 1975, abandoned. This application Nov. 11, 1977, Ser. No. 850,780

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1974, 2446758

Int. Cl.[2] **A61K** *31/415;* **C07D** *233/46*

U.S. Cl. 424—273 R **7 Claims**

1. A compound of the formula



wherein Z is

2-ethyl-6-methyl-phenyl,

2,6-di-trifluoromethyl-phenyl,

2-chloro-6-trifluoromethyl-phenyl or

2-fluoro-6-trifluoromethyl-phenyl,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

7. The method of lowering the blood pressure of a warm-blooded animal in need thereof, which comprises administering to said animal an effective hypotensive amount of a compound of claim **1**.

4,125,621

ANTIOSTEOPOROTIC AGENTS

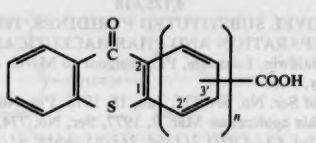
Carlos M. Samour, Wellesley, Mass., and Julius A. Vida, Greenwich, Conn., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 795,570, May 10, 1977, Pat. No. 4,101,668. This application Jan. 4, 1978, Ser. No. 866,930

Int. Cl.[2] **A61K** *31/38*

U.S. Cl. 424—275 **8 Claims**

1. A process for the treatment of a host animal in order to modify the balance between the rate of bone resorption and the rate of bone deposition in said host animal whereby the ratio of said rate of bone resorption to said rate of bone deposition is reduced, comprising administering to said host animal an amount, sufficient to modify said balance and reduce said ratio, of a compound selected from the group consisting of those having the formula:



wherein *n* has a value of 0 or 1 and there is a COOH substituent at the 1, 2, 2′ or 3′ position relative to the S group, and pharmaceutically acceptable salts thereof.

4,125,622

1,4-OXATHIANES

Hans-Eckart Radunz; Dieter Orth; Manfred Baumgarth; Reinhard Lissner, and Jürgen Maisenbacher, all of Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Fed. Rep. of Germany

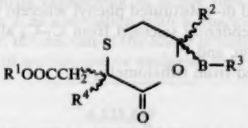
Filed Dec. 14, 1977, Ser. No. 860,355

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658850

Int. Cl.[2] **C07D** *327/06*

U.S. Cl. 424—276 **14 Claims**

1. A 1,4-oxathiane of the formula



and its physiologically acceptable salts

wherein R^1 is H or alkyl having 1–4 C-atoms; R^2 is H or alkyl having 1–4 C-atoms; R^3 is H, alkyl having 1–8 C-atoms, phenyl or phenyl substituted by F, Cl, Br, OH, OCH_3, CF_3 or NO_2; R^4 is H or CH_3; B is a single bond, $—CH_2—$, $—CH_2CH_2—$ or $—CH_2O—$; and a wavy line (∿∿) indicates a bond which can be in the α- or β-position.

14. A method of inhibiting thrombocyte agglomeration which comprises administering to a mammal an antithrombotically effective amount of an oxathiane of claim **1**.

4,125,623

SPASMOLYTICS

Jan Hartog, and Johannes M. A. Zwagemakers, both of Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

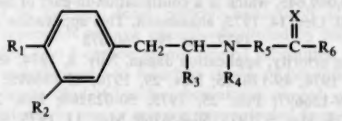
Division of Ser. No. 564,777, Apr. 3, 1975, Pat. No. 3,996,245. This application Sep. 14, 1976, Ser. No. 724,421

Claims priority, application Netherlands, Apr. 8, 1974, 7404733

Int. Cl.[2] **A01N** *9/28*

U.S. Cl. 424—278 **12 Claims**

1. A spasmolytic composition comprising a spasmolytically effective amount of a compound of the formula



in which R_1 represents an alkyl group, an alkoxy group, an alkylthio group or a dialkylamino group having up to 2 carbon atoms per substituent, a hydroxy group, a hydrogen atom, a chlorine atom or a fluorine atom, R_2 is a hydrogen atom or, if R_1 represents a hydrogen atom, in addition one of the remaining meanings of R_1, while R_1 and R_2 both may represent an

alkoxy group having up to 2 carbon atoms, R_3 is an alkyl group having up to 2 carbon atoms, R_4 is an alkyl group having up to 3 carbon atoms, R_5 is a branched or non-branched alkylene group having 3 to 12 carbon atoms, X is an ethylene dioxy group, R_6 is a branched or non-branched or cyclised alkyl group having up to 8 carbon atoms and R_5 together with R_6 contains at least 6 carbon atoms and salts thereof formed with pharmaceutically acceptable acids and a pharmaceutically acceptable carrier therefor.

4,125,624

ADDUCTS OF BIS(TRI-ALKYLTIN)OXIDE USED AS ACARICIDES

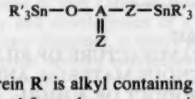
Francis J. Cracco, Brussels, Belgium, and Wayne I. Fanta, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 498,489, Aug. 16, 1974, abandoned, which is a continuation-in-part of Ser. No. 385,129, Aug. 2, 1973, Pat. No. 3,876,795, which is a continuation-in-part of Ser. No. 283,897, Aug. 25, 1972, abandoned. This application Oct. 11, 1977, Ser. No. 840,926

Int. Cl.[2] A01N *9/00*

U.S. Cl. 424—288 **3 Claims**

1. A method of killing acarids comprising the contacting of said acarids or their plant habitats with an acaricidally effective non-phytotoxic amount of an acaricide represented by the formula



wherein R′ is alkyl containing from 5 to 7 carbon atoms, Z is selected from the group consisting of oxygen and sulfur, A is selected from the group consisting of carbon and sulfur, and wherein A and Z are different.

4,125,625

TROPONYL-OXAMIC ACID DERIVATIVES

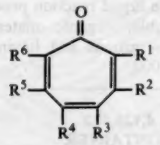
Jehan F. Bagli, Kirkland, and Tibor Bogri, Montreal, both of Canada, assignors to Ayerst, McKenna & Harrison Limited, Montreal, Canada

Continuation-in-part of Ser. No. 697,296, Jun. 17, 1976, Pat. No. 4,057,556. This application May 31, 1977, Ser. No. 801,488

Int. Cl.[2] A61K *31/215;* **C07C** *103/42*

U.S. Cl. 424—305 **7 Claims**

1. A compound of formula I



(I)

in which R^1 and R^4 are the same or different selected from the group consisting of hydrogen, halo, trifluoromethyl, lower alkoxy, lower alkyl, phenyl, hydroxy, phenoxy, mercapto, (2-carboxyphenyl)thio, NR^7R^8 wherein R^7 and R^8 each is hydrogen or lower alkyl or R^7 is lower alkyl and R^8 is p-toluenesulfonyl, and a radical of formula NR^9COR^{10} wherein R^9 is hydrogen or lower alkyl and R^{10} is a radical of formula $COO(CH_2)_nCOR^{11}$ wherein n is an integer from one to six and R^{11} is hydroxy or lower alkoxy: and R^2, R^3, R^5 and R^6 are the same or different selected from the group consisting of hydrogen, halo, trifluoromethyl, lower alkoxy, lower alkyl, phenyl, hydroxy, phenoxy, mercapto, (2-carboxyphenyl)thio and NR^7R^8 wherein R^7 and R^8 each is hydrogen or lower alkyl or R^7 is lower alkyl and R^8 is p-toluenesulfonyl: with the proviso that at least one of R^1 and R^4 must be a radical of formula NR^9COR^{10} wherein R^9 and R^{19} are as defined herein; or a terapeutically acceptable salt thereof.

6. A method for suppressing allergic manifestations of anaphylactic reactions and atopic hypersensitivity in a mammal which comprises administering to said mammal an effective amount of a compound of claim **1**, or a therapeutically acceptable salt thereof.

7. A pharmaceutical composition useful in suppressing allergic manifestations of anaphylactic reactions and atopic hypersensitivity comprising an effective amount of compound of claim **1**, or a therapeutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

4,125,626

SYNTHESIS AND USE OF L-γ-GLUTAMYL-DOPA

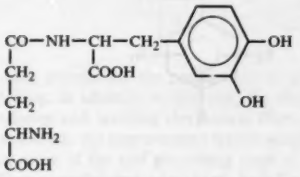
Marian Orlowski, and Sherwin Wilk, both of New York, N.Y., assignors to Mt. Sinai School of Medicine of the City University of New York, New York, N.Y.

Filed Jan. 17, 1977, Ser. No. 759,831

Int. Cl.[2] A61K *31/195*

U.S. Cl. 424—319 **2 Claims**

1. A method for increasing renal blood flow in mammals which comprises administering a dose, effective to increase renal blood flow, of a compound:



4,125,627

FORMAMIDINE INSECTICIDAL COMPOUNDS

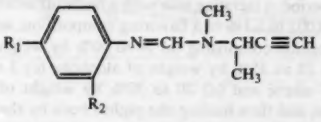
Ferenc M. Pallos, Walnut Creek, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 449,792, Mar. 11, 1974, Pat. No. 4,071,556. This application Nov. 18, 1977, Ser. No. 852,659

Int. Cl.[2] A01N *9/20*

U.S. Cl. 424—326 **6 Claims**

1. A method of controlling insects consisting of applying to the habitat of said insects an insecticidally effective amount of a compound having the formula:



wherein R_1 and R_2 are independently methyl or halogen.

4,125,628

DISINFECTANT COMPOSITION

Tevis M. Goldhaft; Charles Kaitz, both of Vineland, and George D. Maier, Bridgeton, all of N.J., assignors to Vineland Laboratories, Inc., Vineland, N.J.

Continuation of Ser. No. 581,728, May 29, 1975, Pat. No. 4,022,911, which is a continuation of Ser. No. 287,770, Sep. 11, 1972, abandoned, and a continuation-in-part of Ser. No. 94,538, Dec. 2, 1970, abandoned, which is a continuation-in-part of Ser. No. 663,552, Aug. 28, 1967, abandoned. This application Oct. 18, 1976, Ser. No. 733,200

The portion of the term of this patent subsequent to May 10, 1994, has been disclaimed.

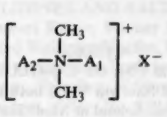
Int. Cl.[2] A01N *9/02, 9/20, 9/24, 9/26*

U.S. Cl. 424—329 **3 Claims**

1. A disinfectant composition comprising an admixture of:

(a) from about 10 to about 150 parts formaldehyde;

(b) from about 1 to about 20 parts of a dimethyl quaternary ammonium halogen salt having the formula:



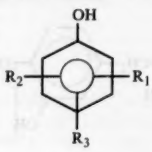
wherein,

X is bromine, chlorine, or iodine,

A_1 is alkyl or aryl, and

A_2 is alkyl or aryl; and

(c) from about 1 to about 20 parts of an organic compound having the formula:



wherein,

R_1 is hydrogen, halogen, alkyl, or aryl "having no more than about seven carbon atoms",

R_2 is hydrogen, halogen, alkyl, or aryl "having no more than about seven carbon atoms", and

R_3 is hydrogen, halogen, alkyl, or aryl"having no more than about seven carbon atoms; and wherein components (a), (b), and (c) act together to produce a synergistic effect".

4,125,629

PROCESS FOR IMPROVING GROWTH RATE OF PIGLETS DURING WEANING

Jean E. Rossi, Petit-Lancy, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

Continuation-in-part of Ser. No. 690,868, May 28, 1976, abandoned. This application Apr. 12, 1977, Ser. No. 786,883

Int. Cl.[2] A23K *1/18*

U.S. Cl. 426—2 **2 Claims**

1. A process for reducing the weaning period of piglets which comprises feeding, for a period of at least one week before parturition, a pregnant sow and subsequently, for the lactation period, a lactating sow with a feedstuff aromatized by means of 0.001 to 0.1% of a flavoring composition, said flavoring composition comprising (a) 30 to 50% by weight of aldehydes; (b) 25 to 35% by weight of alcohols; (c) 3 to 7% by weight of esters; and (d) 20 to 30% by weight of terpenes derivatives; and then feeding the piglets born by the said sow a solid feedstuff aromatized by means of the same type of flavoring composition.

4,125,630

PLIABLE VEGETABLE PROTEIN PRODUCTS

Frank T. Orthoefer, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Nov. 22, 1976, Ser. No. 744,205

Int. Cl.[2] A23J *3/00*

U.S. Cl. 426—104 **29 Claims**

1. A method for preparing pliable vegetable protein products, said method comprising:

(a) preparing a homogeneous aqueous dispersion having an acidic pH between about 1.5 to about 3.5 or a basic pH from about 7.5 to about 9.5 comprised of water as a major constituent, and as minor constituents edible plasticizer and heat denaturable vegetable proteinaceous material wherein the protein content constitutes at least 25% of the non-aqueous substance weight with at least a major portion of the protein being in the water-soluble form;

(b) subjecting the homogeneous aqueous dispersion to an elevated temperature for a period of time sufficient to heat-denature the vegetable protein and to dry the aqueous dispersion to a water content of less than 20%, thereby providing a dry, heat-denatured, friable, proteinaceous mass; and

(c) hydrating the dry, friable, proteinaceous mass in the presence of an edible organic acid having a Pk_a ranging from about 3.0 to about 5.0 or alternatively by adding said edible organic acid to the hydrated mass, said acid used in amount to provide a hydrated, pliable, fibrous vegetable protein product.

4,125,631

PREPARATION FOR THE MANUFACTURE OF FILMS COMPRISING A COLLAGENOUS MATERIAL AND LIQUID REACTION PRODUCT OF A HIGH MOLECULAR WEIGHT WATER-INSOLUBLE, ORGANIC MATERIAL

Bruno Stahlberger, Wiesenstrabe 10, Buchs, Switzerland, and Werner von Dach, Zweistäpflestrabe 670, Balzers, Liechtenstein

Continuation-in-part of Ser. No. 489,097, Jul. 17, 1974. This application Aug. 26, 1975, Ser. No. 607,953

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1973, 2336561; Aug. 29, 1974, 2441419

Int. Cl.[2] A22C *13/00;* **B28B** *19/00*

U.S. Cl. 426—105 **28 Claims**

1. A preparation for the manufacture of shaped films, such as tubular sausage casings, which comprises

(a) a collagenous material; and

(b) 0.1 to 5% by weight, based on the dry weight of collagen in component (a), of a liquid reaction product of glyoxal with a water-insoluble, organic material containing $-NH_2-$ or $=NH-$ groups and having a molecular weight of at least 20,000.

4,125,632

CONTAINER

Donald C. Vosti, Crystal Lake, Ill., and Alan Silverman, Norwalk, Conn., assignors to American Can Company, Greenwich, Conn.

Continuation-in-part of Ser. No. 743,960, Nov. 22, 1976, abandoned. This application Aug. 15, 1977, Ser. No. 824,806

Int. Cl.[2] B65D *7/42, 85/72*

U.S. Cl. 426—111 **20 Claims**

1. A body for a container which is adapted, when closed, to hold a product under vacuum, comprising a sidewall and a bottom wall integrally formed as a single piece from a relatively rigid synthetic resinous material, said sidewall being generally cylindrical with an open upper end, having means adjacent said upper end for hermetically securing a closure thereto and having, at the juncture with said bottom wall, a bulge of curvilinear cross-section, taken longitudinally through said sidewall, said bottom wall closing the lower end

of said sidewall and being of circular configuration, said body having an angular, downwardly-directed circumferential edge at said juncture and extending about said bottom wall, said material in said bulge being thinner than that in the remainder of said sidewall and said material in the portion of said bottom wall adjacent said circumferential edge being thinner than said

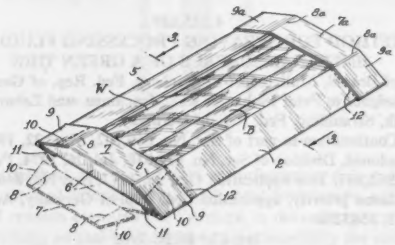
material of said bulge so that, upon hermetic sealing of said body and development of a substantial vacuum within the resultant container, at least a portion of said bulge may deform, to permit upward movement of said bottom wall, to thereby diminish the volume of the container and hence the vacuum level therewithin.

4,125,633

BACON OR LIKE CONTAINER, BLANK THEREFOR, BACON PACKAGE AND METHOD OF PACKAGING BACON THEREIN

Thomas Vander Lugt, Jr., Kalamazoo, Mich., assignor to Brown Company, Kalamazoo, Mich.

Filed Aug. 6, 1976, Ser. No. 712,143
Int. Cl.² B65D *85/00*
U.S. Cl. 426—121 **9 Claims**



1. An integral blank for a window folder, having a generally rectangular top plan view and a rectangular window therein, cut and scored to provide:

a bottom wall,

a pair of opposed side walls hingedly connected to said bottom wall along opposite edges of said bottom wall,

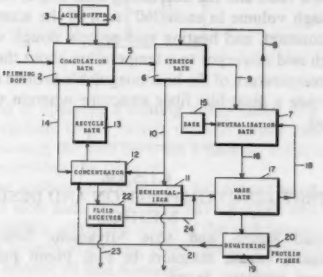
a pair of opposed end walls hingedly connected to said bottom wall along the other opposite edges of said bottom wall and having a configuration defining at least one trapezoid having its shorter base outwardly extending, a relatively narrow outer top end panel hingedly connected to the outwardly extending shorter base of said trapezoid-comprising end wall, end flaps connected to a top end panel, said top end panel or said top end panel end flaps being adapted to be adhesively affixed to said side walls or said bottom wall for securing said side walls and said top end panels in fixed juxtaposition with respect to each other, thereby to provide a stable window folder upon erection of the same from said blank, wherein a severance line is provided in a side wall for provision of a readily liftable section of said side wall in a folder erected from said blank.

4,125,634

COAGULATION AND FLAVORING OF SPUN PROTEIN FIBERS

Lawrence G. Plaskett, High Wycombe, England, assignor to Biotechnical Processes Limited, London, England

Filed Apr. 20, 1977, Ser. No. 789,383
Claims priority, application United Kingdom, Apr. 21, 1976, 16084/76
Int. Cl.² A23J *3/00*
U.S. Cl. 426—231 **34 Claims**



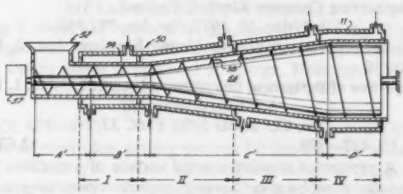
1. In a process for the preparation of spun protein fibers comprising, in addition to spinning, the steps of coagulation, neutralizing and washing the protein fibers free from excess acid and alkali, the improvement which comprises carrying out one or more of the said processing steps of fiber coagulation and fiber neutralizing in a treatment bath fluid which contains, as treating agents for the fibers, one or more of the following: a nitrogen-containing organic acid, a nitrogen-containing organic acid salt or a nitrogen-containing organic buffering agent, in a concentraion sufficient to provide the principal buffering capacity in the treatment bath fluid wherein the one or more treating agents are not completely washed out of the fibers and remain in the finished fibers.

4,125,635

METHOD FOR MAKING A MEAT ANALOG

Peter W. A. de Ruyter, 1775 des Erables, St. Bruno, Quebec, J3V 4P2, Canada

Filed Apr. 26, 1977, Ser. No. 791,137
Int. Cl.² A23J *3/00*
U.S. Cl. 426—506 **9 Claims**



1. A method for texturizing protein products comprising the steps of forming a wet protein dough containing a heat-coagu-

lable protein, passing said dough through a conveyor comprised of a barrel having a constant internal diameter and a rotatable screw therein, said screw having a root of increasing diameter and helical flights thereon of an increasing helix angle, said root of increasing diameter and said increasing helix angle being such that the volume of dough in any 360° turn of the screw is substantially constant, and heating said dough while passing through said conveyor to a temperature above the heat-coagulation temperature of the heat-coagulable protein in said dough to provide a meat-like fiber structure wherein the fibers are aligned in a curvi-linear manner.

4. A method for texturizing protein products comprising the steps of forming a wet protein dough containing heat coagulable protein, passing said dough through a conveyor comprised of a barrel of an increasing internal diameter, said barrel having a rotatable screw therein, said screw having a root of increasing diameter, said root diameter increasing at a rate greater than the increase in the internal diameter of the barrel, and helical flights on said screw root, said helical flights being of a decreasing helix angle, the rate of increase of the internal diameter of the barrel, the rate of increase of the diameter of the screw root, and the decreasing helix angle, being such that the dough volume in each 360° turn of the screw is substantially constant, and heating said protein dough while passing through said conveyor to a temperature about the heat-coagulation temperature of the heat-coagulable protein in said dough to provide a meat-like fiber structure wherein the fibers are oriented.

4,125,636
DESENSITIZING COMPOSITION AND DESENSITIZING METHOD

Takayoshi Kamio, and Akio Miyamoto, both of Minami Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Filed Jul. 7, 1976, Ser. No. 703,147

Claims priority, application Japan, Jul. 7, 1975, 50/83305

Int. Cl.[2] B41M *5/00*

U.S. Cl. 427—150 **15 Claims**

1. A method of desensitizing an adsorbant contained in a pressure-sensitive recording material, said absorbant being an electron-acceptor and forming color upon reaction with a colorless color former which is an electron-donater, which comprises applying a desensitizing composition containing at least one compound obtained by the addition reaction of one or more α,β-unsaturated acid derivatives or one or more α,β-unsaturated ketones with one or more amines, in said addition reaction, a nitrogen atom(s) of said one or more amines being bonded to a α,β-unsaturated carbon atom of said one or more α,β-unsaturated acid derivatives or said one or more α,β-unsaturated ketones to portions of the absorbant where color formation is not required.

4,125,637
PROCESS FOR EMBEDDING HARD PARTICLES IN A BEARING SURFACE

John E. Tanner, Wolverhampton, England, assignor to Laystall Engineering Company Limited, England

Filed Mar. 30, 1977, Ser. No. 782,940

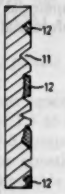
Claims priority, application United Kingdom, Apr. 2, 1976, 13545/76

The portion of the term of this patent subsequent to Jun. 1, 1993, has been disclaimed.

Int. Cl.[2] B05D *5/00;* **F16C** *33/24*

U.S. Cl. 427—198 **13 Claims**

1. A process of treating a metal surface of a machine part, especially a rubbing or bearing surface, comprising a first operation of deliberately impregnating the machine part surface with particles of a hard grit, harder than said metal surface, by mechanically forcing the grit into the surface so as to become permanently embedded therein, the operation being carried out at ordinary ambient temperatures using a resilient-



ly-loaded tool to force in the particles and a further operation of lapping the impregnated surface using a fine carbide grit.

4,125,638
DRY CELLS WITH STAINLESS STEEL CURRENT COLLECTOR

Jun Watanabe, Amagasaki; Akira Ohta, Hirakata, and Shigeo Kobayashi, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 10, 1976, Ser. No. 749,275

Claims priority, application Japan, Dec. 18, 1975, 50/151463; Dec. 29, 1975, 50/159303

Int. Cl.[2] H01M *2/20*

U.S. Cl. 429—199 **7 Claims**

1. A dry cell comprising

(a) a depolarizing mix consisting essentially of manganese dioxide, carbon black and zinc perchlorate as an electrolyte,

(b) an anode made of zinc, and

(c) a cathode collector made of an alloy containing iron as a major component and more than 10% by weight of chromium.

4,125,639
METHOD FOR SPRAYING PROCESSING FLUID ON INTERNAL SURFACE OF A GREEN TIRE

Josef Brandl, Mallersdorf-Pfaffenberg, Fed. Rep. of Germany, assignor to Peter Ilmberger KG, Maschinen -und Zahnradfabrik, Straubling, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 669,202, Mar. 22, 1976, abandoned, Division of Ser. No. 492,018, Jul. 26, 1974, Pat. No. 3,962,987. This application Oct. 28, 1977, Ser. No. 846,458

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1973, 2343280

Int. Cl.[2] B05C *7/02*

U.S. Cl. 427—233 **4 Claims**

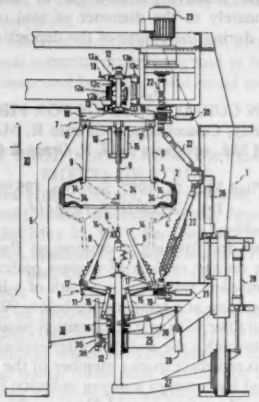
1. A method for spraying a processing liquid on the interior surface of a green radial tire, said green radial tire having flexible sides and beaded edges around internal edges of said sides, said method comprising:

positioning said green radial tire in a horizontal position whereby said green radial tire has an upper and a lower beaded edge;

charging a first grasping device having spreadable grasping elements with said tire by grasping the upper beaded edge of said tire at spaced apart locations;

conveying said first grasping device to a position above and oppositely facing a second grasping device having spreadable grasping elements;

grasping the lower beaded edge of said tire at spaced apart locations with said second grasping device;



vertically separating the upper and lower beaded edges by pulling on the upper and lower beaded edges; and

spraying the interior tire surface.

4,125,640

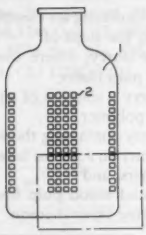
METHOD OF MANUFACTURING DEFECT FREE NICKEL ARMORED LABORATORY AND INDUSTRIAL BRITTLEWARE

Louis A. Conant, 218 Chapel Hill Dr., Rochester, N.Y. 14617; Wilbur M. Bolton, 162 Vollmar Pkwy., Rochester, N.Y. 14623, and James E. Wilson, Box 123, Livonia, N.Y. 14487

Continuation-in-part of Ser. No. 568,422, Apr. 21, 1975, abandoned. This application Dec. 23, 1976, Ser. No. 753,591

Int. Cl.[2] C23C *11/02;* B65D *1/02*

U.S. Cl. 427—250 **3 Claims**



1. A method for consistently manufacturing defect free nickel armored laboratory and industrial brittleware, which method consists essentially of the steps, in the order given, of

(a) forming an anti-bonding layer on substantially the entire external surface of a unit of laboratory or industrial brittleware,

(b) at an elevated temperature between about 350° F. and about 800° F., forming by chemical vapor deposition on said anti-bonding layer a layer of nickel having a thickness of about 10 mils, and

(c) then lowering the temperature of the resulting nickel armored brittle-ware, to thereby strengthen said brittleware by subjecting it to a strong compressive force, whereby said anti-bonding layer prevents damage to said brittle-ware by said layer of nickel by preventing the development of stress concentrations due to unequal expansions and contractions of said layer of nickel and said brittle-ware.

4,125,641

METHOD FOR APPLYING A COATING COMPOSITION ONTO A MOVING PAPERWEB

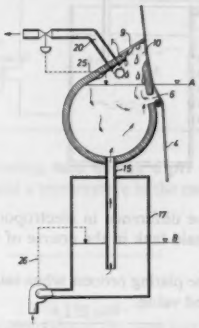
Hans I. Wallsten, Lausanne, Switzerland, assignor to Inventing S.A., Lausanne, Switzerland

Filed Oct. 15, 1975, Ser. No. 622,494

Claims priority, application Sweden, Oct. 16, 1974, 7413068

Int. Cl.[2] B05D *3/00*

U.S. Cl. 427—296 **2 Claims**



1. A method of applying a coating composition to a paper web of indeterminate length, which method totally eliminates the need for passing the web between a backing roller and an applicator, comprising the steps of:

providing an applicator housing having spaced apart upper and lower slots each of said slots having upper and lower edges extending across the width of the web being coated;

providing a source of coating composition communicating with the interior of said housing;

drawing said web across both of said slots and moving the web in a direction transverse to the long dimension of the slots so that the web moves generally upwardly;

scraping excess composition from the web as it passes the upper end of the upper slot with a flexible scraping member;

maintaining a vacuum in the interior of said housing which vacuum condition is of a magnitude sufficient to draw coating composition from said source into said housing and to draw the portion of the web moving across the upper slot into more intimate engagement with said upper slot and to maintain the level of coating composition in said housing above the upper edge of the lower slot and below the lower edge of the upper slot to cause an excess amount of coating composition to be dispensed through said lower slot and upon said web, whereby the coating composition is smoothed as the web passes over the upper flexible edge of the upper slot and excess composition is returned directly to and combined with the coating composition presently in said housing.

4,125,642

METHOD FOR CONDUCTING ELECTROLESS METAL-PLATING PROCESSES

George S. Petit, and Ralph R. Wright, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 25, 1977, Ser. No. 827,658

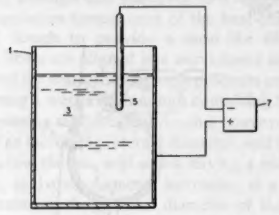
Int. Cl.[2] C23C *3/02*

U.S. Cl. 427—8 **5 Claims**

1. In an electroless plating process for depositing a selected metal on a catalytic surface selected from metals of the group consisting of iron, cobalt, nickel, ruthenium, rhodium, palladium, osmium, iridium, and platinum, and utilizing a plating bath including an aqueous solution containing a water-soluble salt of said metal and a hypophosphite reducing agent for said

salt, said process being conducted in a nitric-acid-passivated stainless-steel tank in contact with said bath, the improvement comprising:

inserting in said bath an electrically conductive probe having a surface of chrome, which is non-catalytic and nonreactive with respect to the plating bath;



monitoring the difference in electropotential between said probe and said tank in the course of the plating process; and

terminating the plating process when said difference reaches a preselected value.

4,125,643

PROCESS FOR DEPOSITING ELEMENTAL SILICON SEMICONDUCTOR MATERIAL FROM A GAS PHASE

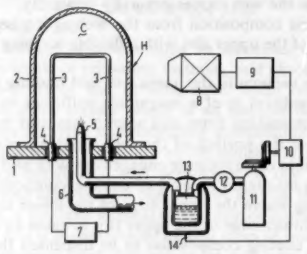
Konrad Reuschel, Vaterstetten; Wolfgang Dietze, and Ulrich Rucha, both of Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 4, 1977, Ser. No. 774,636

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1976, 2609564

Int. Cl.[2] B05D *5/12*; B01J *17/28*

U.S. Cl. 427—9 **3 Claims**



1. In a process for depositing elemental silicon from a reactive gas comprised of a mixture of a halogen silane and hydrogen whereby the reactive gas flows through a reaction housing containing a heated mandrel on which silicon is deposited from such gas and wherein the deposition rate of silicon onto the mandrel surface varies during the course of the deposition process, the improvement comprising:

chronologically maintaining a relatively constant temperature at the mandrel surface and maintaining a relatively constant composition within the reactive gas;

varying the reactive gas through-put past the mandrel in such a manner that the deposition rate of silicon onto the mandrel surface remains substantially constant throughout the deposition process, said deposition rate being selected at the beginning of the deposition process in relation to a surface unit area of the mandrel and in relation to a unit of time, so that the deposition rate of silicon per unit area of mandrel surface and per unit time is maintained so as to be at least about 0.1 gram per square centimeter per hour and less than about 0.5 gram per square centimeter per hour; and

increasing the reactive gas through-put past said mandrel proportionately to the diameter of said mandrel which increases during the course of the deposition process.

4,125,644

RADIATION CURED COATINGS FOR FIBER OPTICS

Arthur D. Ketley, Columbia, and Charles R. Morgan, Brookeville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed May 11, 1977, Ser. No. 795,997

Int. Cl.[2] G02B *1/10, 5/14*

U.S. Cl. 427—36 **6 Claims**

1. A process for forming a continuous flexible adherent cured coating on the surface of a glass optical fiber which comprises immersing said fiber in a bath of a liquid radiation curable composition at a temperature below 90° C. thus coating said optical fiber with said composition passing said coated optical fiber through a die and thereafter exposing said coated optical fiber to radiation from a member of the group consisting of U.V. and high energy ionizing radiation for a time sufficient to cure said coating on said fiber.

4,125,645

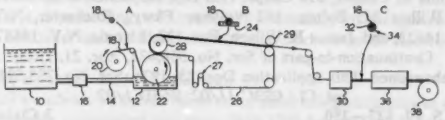
LATEX MODIFIED PULP INSULATED CONDUCTORS

John A. Jukes, Pierrefonds; Thomas C. Pound, Hudson, and Wayne A. Cascarano, Otterburn Park, all of Canada, assignors to Northern Telecom Limited, Ottawa, Canada

Filed Sep. 29, 1975, Ser. No. 617,324

Int. Cl.[2] H01B *3/48, 7/02*

U.S. Cl. 427—117 **10 Claims**



1. A process for insulating an electric wire conductor comprising, in sequence, the steps of:

preparing a fibre slurry, where the fibers consist substantially of wood pulp fibers;

adding to the slurry a solution of an aqueous based cationic deposition aid polymer;

adding to the slurry containing the wood pulp and the deposition aid polymer an aqueous based anionic latex polymer to coat said fibers; and

applying the coated wood pulp fibers to the conductor to form an insulative layer thereon.

4,125,646

DIFFUSION COATING OF MAGNESIUM IN METAL SUBSTRATES

Michael F. Dean, and Roy L. Blize, both of San Antonio, Tex., assignors to Chromalloy American Corporation, West Nyack, N.Y.

Division of Ser. No. 635,619, Nov. 26, 1975, Pat. No. 4,036,602. This application Mar. 31, 1977, Ser. No. 783,396

Int. Cl.[2] C23C *9/02*

U.S. Cl. 427—253 **25 Claims**

1. A method of protecting a metal substrate against corrosive environments which comprises,

coating said metal substrate with a magnesium-reacting matrix metal selected from the group consisting of silver, copper, nickel, cobalt, cerium, silicon, tin and zinc capable of forming at least one intermetallic compound with magnesium which is anodic relative to the metal substrate, embedding said metal substrate in a magnesium-containing pack,

and then pack diffusing magnesium into the coating of said substrate at an elevated diffusion temperature below the melting point of magnesium, thereby forming said intermetallic compound,

whereby an adherent sacrificial coating is produced anodic to said metal substrate comprising said at least one intermetallic compound bonded to said metal substrate.

4,125,647

METHOD OF PRODUCING ONE-SIDE PLATED STEEL SHEETS OR STRIPS

Minari Goto, and Hideo Komura, both of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed May 25, 1977, Ser. No. 800,294
Claims priority, application Japan, Jun. 1, 1976, 51-63942
Int. Cl.[2] C23C *1/02, 1/08*
U.S. Cl. 427—300 **8 Claims**

1. A method of producing one-side plated steel sheets or strips, comprising coating an aqueous slurry of an anti-plating agent, the amount of which is in the range of 20–150 g/m^2 in dry weight, and which forms after heating and dehydration a compound having a chemical composition represented by the formula of

$$pM_2O.qSiO_2.rB_2O_3.sMgO$$

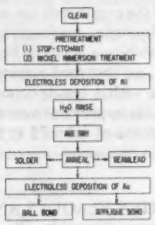
wherein M represents an alkali metal and *p, q, r* and *s* represent the numbers of moles of M_2O, SiO_2, B_2O_3, and MgO respectively, and the ratio of *p:q:r:s* is (0.5–9.0):1:(0.1–7.2):(1.0–34.5), on one side of a steel sheet or strip; heating the steel sheet or strip to form a film thereon; and then dipping the steel sheet or strip in a plating bath containing at least one member of the group consisting of molten zinc, aluminum, and zinc-aluminum alloy, to plate only that side of the steel sheet or strip which is not coated with said film.

4,125,648

ELECTROLESS DEPOSITION OF NICKEL ON ALUMINUM

Frederick Vratny, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 754,124, Dec. 27, 1976. This application Apr. 14, 1978, Ser. No. 896,346
Int. Cl.[2] C23C *3/02*
U.S. Cl. 427—305 **4 Claims**



1. A method for chemically depositing nickel on an aluminum or aluminum alloy surface comprising the steps of:

(a) cleaning said surface;

(b) immersing said surface in a first solution of buffered hydrofluoric acid and a nonaqueous solvent;

(c) without rinsing, immersing said surface in a second solution comprising:

	Grams/Liter H_2O
Nickel sulfate	1.1–50
Ammonium chloride	3–40
p-Toluene sulfonic acid	0.01–0.5

-continued

	Grams/Liter H_2O
Buffered hydrofluoric acid	0.1–10

(d) without rinsing, immersing said surface in an electroless plating bath comprising:

	Per 1.5 liters H_2O
Nickel sulfate	15–45 g
Sodium acetate	5–45 g
Sodium hypophosphite	2.5–25 g
Buffered hydrofluoric acid	trace –10 ml
p-Toluene sulfonic acid	trace–0.15 g
Formaldehyde	trace–50 ml
Ethanol	trace–50 ml
Boric acid	trace–65 g

said electroless plating bath having a pH in the range of about 3.5 to 7 and a temperature in the range of about 25° C. to 95° C.

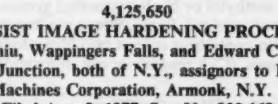
4,125,649

PRE-ETCH CONDITIONING OF POLYSULFONE AND OTHER POLYMERS FOR ELECTROLESS PLATING

Lawrence P. Donovan, Temple City; Eileen Maguire, and Leon A. Kadison, both of Pasadena, all of Calif., assignors to Crown City Plating, El Monte, Calif.

Filed May 27, 1975, Ser. No. 581,038
Int. Cl.[2] B05D *3/10*
U.S. Cl. 427—307 **18 Claims**

1. In a process for electroless plating of a polymeric substrate with a metal which includes the step of contacting the surface of the substrate with an inorganic etch prior to electroless plating, the improvement which comprises contacting, prior to contact with the inorganic etch, a polymeric substrate selected from the group consisting of polysulfones and polycarbonates with an aqueous solution of a water compatible halogenated compound containing from 1 to about 6 carbon atoms and a functional group selected from



wherein X is hydrogen or an alkali metal and in which a halide is separated from the functional group by no more than three carbon atoms at a temperature and for a time sufficient to modify the surface of the polymeric substrate to at least induce adhesion of the electroless plate thereto.

4,125,650

RESIST IMAGE HARDENING PROCESS

George T. Chiu, Wappingers Falls, and Edward C. Fredericks, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

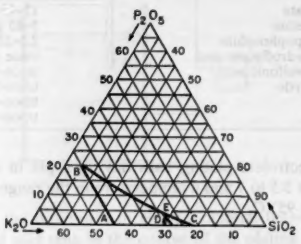
Filed Aug. 8, 1977, Ser. No. 822,468
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—337 **16 Claims**

1. A process for forming a flow resistant organic polymeric resist mask on a substrate comprising coating the mask with a solution of a quinone diazide hardening agent to form a layer of hardening agent on the resist mask, heating the coated mask to cause the agent to react with the exposed surfaces of the mask and then removing the excess hardening agent.

4,125,651
METHOD FOR MAKING CHEMICALLY DURABLE SILICATE COATINGS

Larry E. Campbell, Corning, and Stanley D. Stookey, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation of Ser. No. 435,703, Jan. 23, 1974, abandoned. This application Aug. 30, 1976, Ser. No. 718,773
Int. Cl.[2] D02G 3/00
U.S. Cl. 427—372 B 6 Claims



1. A method for making chemically durable, crystalline, inorganic silicate coatings which consists in the steps of:

(a) preparing true, non-hygroscopic, aqueous solutions having a pH between about 9–15 containing about 1–12 moles of SiO_2/liter from aqueous alkali metal silicate solutions, wherein at least 50% by weight of the alkali metal is present at potassium, and also containing a soluble essentially completely hydrolyzed species of a metal oxide (M_xO_y), wherein the ratio Y:X is at least 1.5, in such an amount that the total solids content of the solution is at least 10% by weight;

(b) applying said solutions to a surface of an article; and

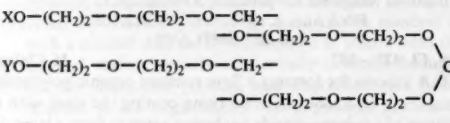
(c) curing said solutions at a temperature above about 40° C. for a sufficient length of time to cause the crystallization in situ of crystals which cause a reduction in pH of the solution resulting in polymerization of the silica at the crystal interfaces and subsequently throughout the solution.

4,125,652
TREATMENT PROCESS FOR TEXTILE SUBSTRATES COMPRISING REGENERATED CELLULOSE

Paul Komminoth, Therwil; Tibor Robinson, Birsfelden, and Milica Urosevic, Basel, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed May 13, 1977, Ser. No. 796,640
Claims priority, application Switzerland, May 20, 1976, 6349/76
Int. Cl.[2] D06M 13/14, 13/22, 13/38
U.S. Cl. 427—390 C 23 Claims

1. A treatment process for textile substrates comprising or consisting of regenerated cellulose, which process comprises applying to the substrate an aqueous medium comprising an effective amount of each of: (A) a monomeric, hydrolysis stable, hydrosoluble, resin cross-linking agent containing at least two N-methylol or N-alkoxymethyl groups, (B) a hydrosoluble, prepolymerized, linear, filler resin forming, cross-linking agent, also containing at least two N-methylol or N-alkoxymethyl groups, (C) a reactive acetal of formula



wherein X and Y, independently, are H or CH_2OH, (D) a first cross-linking catalyst, being an alkaline earth metal salt of a strong acid and (E) a second cross-linking catalyst, being an acidic aluminium salt, subsequently drying the substrate and subjecting same to a temperature at which cross-linking takes place.

4,125,653
GRAPHIC LAMINATE AND METHOD OF MAKING SAME

Glenn M. Muzik, 10809 Hastings, Westchester, Ill. 60153

Filed Jan. 31, 1977, Ser. No. 764,198
Int. Cl.[2] A61F 13/02
U.S. Cl. 428—40 15 Claims

1. A graphic laminate for mounting a sheet-like graphic article comprising a flat mounting base; a layer of plastic material having a pressure sensitive adhesive coating on both surfaces thereof and being in interfacial contact and substantially coextensive with and permanently bonded to the front side of said base; and a sheet-like graphic article being in interfacial contact and substantially coextensive with and permanently bonded to the front side of said plastic material, whereby said graphic article is permanently mounted for display.

4,125,654
INFORMATION SIGNAL RECORDING DISC

Akira Kaneko; Masaki Ohya; Masayasu Suzuki, and Akio Kobayashi, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1977, Ser. No. 804,758
Claims priority, application Japan, Jun. 11, 1976, 51-68406; Jun. 18, 1976, 51-72022; Dec. 10, 1976, 51-148538
Int. Cl.[2] H04N 1/28, 1/30; C08L 9/02; B32B 27/32
U.S. Cl. 428—64 10 Claims

1. An information signal recording disc comprising at least one nitrile copolymer having therein an unsaturated nitrile content of from 40 to 90 percent by weight wherein the unsaturated nitrile units of the copolymer are selected from the group consisting of acrylonitrile, methacrylonitrile, and mixtures thereof, said disc exhibiting a Clash-Berg flex temperature of from 50° to 120° C., an absorbed impact energy of at least 0.5 kg.cm. when tested with a test specimen thereof of a 2-mm. thickness by a Dynstat impact test according to BS-1330-1946, and a Shore D hardness of from 75 to 95.

4,125,655
DECORATIVE PLAQUES AND PROCESS

James C. Kanzelberger, Riverside, Ill., assignor to Contemporary, Inc., River Forest, Ill.

Continuation of Ser. No. 579,419, May 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 454,166, Mar. 25, 1974, Pat. No. 3,940,864. This application Feb. 22, 1977, Ser. No. 770,797
Int. Cl.[2] B44C 1/28; B32B 3/00; G09F 7/00
U.S. Cl. 428—67 12 Claims

1. An article adapted to be imprinted by a hot-stamping process, said article being suitable for forming a wall plaque, comprising:

(a) a rigid board-like background support material having upper and lower surfaces, at least one of which surfaces has a discrete decorative appearance;

(b) a plastic laminated plate smaller than, and adhered to, the decorative surface of the support material, said laminate comprising a first relatively thick sheet of plastic material having heat deformable characteristics such that the material debosses under localized heat and pressure, and a second relatively thin sheet of a decorative plastic film coextensive therewith which conforms to said debossments when said first sheet is debossed; and

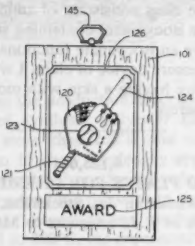
(c) a hot stamping foil positioned over said decorative film, said hot-stamping foil containing on the surface adjacent the plastic laminate coloring matter which transfers and adheres to said decorative plastic film in said debossments when said film is debossed under localized heat and pressure.

12. A product made by the process of:

(a) forming a rigid background of substantial thickness, and a predetermined area;

(b) forming on one surface of said board a finish having decorative qualities;

(c) forming a laminate of a decorative plastic film covering a plastic plate, said laminate having an area which is smaller than said background board, said plastic plate



having a heat deformable characteristic such that said plastic of said plate debosses under a predetermined localized heat and pressure, said plastic film laminated to said plate and being capable of conforming to the contours of said debossment while containing the flow of said plastic plate without said plastic film being damaged by said predetermined heat and pressure;

(d) adhering said laminated plastic plate to said one surface, whereby the background finish is displayed to view in those areas which are not covered by said plate;

(e) positioning over the laminated film on said plate an overlying, but separate, carrier film with a layer of coloring matter thereon and facing said laminated film, said covering matter being capable of transferring simultaneously with debossment to said decorative plastic film under said predetermined heat and pressure;

(f) hot-stamping said plate with a heated die to simultaneously (1) deboss the plastic of the plate and cause the plastic film to form itself into the contours of the debossed plastic plate, and (2) transfer said coloring matter from said carrier film onto said laminated film in the debossed portions of the plate; and

(g) removing the carrier film.

4,125,656

ABSORBENT PAD FOR TOILET BASE

Adelene B. Creamer, 137 Palmer Ave., Mountain View, Calif. 94040

Continuation of Ser. No. 121,671, Mar. 8, 1971, abandoned. This application Jun. 21, 1973, Ser. No. 372,379

Int. Cl.[2] B32B *3/02, 3/28;* **C09J** *7/02;* **E03D** *11/00*

U.S. Cl. 428—80 **4 Claims**

1. A disposable pad for absorbing moisture adjacent to the base of a toilet comprising: a sheet of absorbent material, said sheet having a substantially U-shaped configuration to present an inner periphery, an outer periphery, a pair of spaced sides, and a central portion interconnecting proximal ends of the sides, whereby the sheet can at least partially surround and conform to the base of a toilet, said sheet having a number of pleats thereon extending through the entire distance between said inner and outer peripheries at the junction of the central

portion and each side, respectively, for adjusting the spacing between said sides and for changing the configuration of said inner periphery; and means on the sheet for holding the same against a change in the spacing between the sides and the configuration of said inner periphery.

4,125,657

DECORATIVE ARTICLE AND METHOD

Jose B. Gonzalez, Estado Apure, El Amparo, Venezuela

Filed Oct. 26, 1977, Ser. No. 845,825

Int. Cl.[2] D06P *3/00*

U.S. Cl. 428—90 **8 Claims**

1. A method of manufacturing a decorative article, said method comprising the steps of:

(a) producing a chemically pure, over-saturated solution of potassium aluminosilicate;

(b) coating a substrate to be decorated with flock;

(c) introducing the substrate into the solution;

(d) removing the substrate from the solution after crystals have grown on the substrate;

(e) drying the crystals; and

(f) coating the crystals with a transparent, brilliant liquid plastic.

4,125,658

APPARATUS FOR USE IN DRAWING OR MARKING GRAPHIC CHARACTERS ON A SURFACE

John S. Miles, London, England, assignor to Post Office, London, England

Filed Jul. 2, 1976, Ser. No. 702,146

Claims priority, application United Kingdom, Jul. 3, 1975, 28042/75

Int. Cl.[2] B41L *13/00;* **B05C** *17/06*

U.S. Cl. 428—131 **10 Claims**

1. Apparatus for use in positioning characters on a surface, the apparatus comprising a set of character-defining indicia, there being indicia of a number of different types, each type representing a particular character and associated with each indicium a respective mark on each of two opposite sides of each indicium having a predetermined location relative to the

indicium to show how the particular indicium is to be spaced relative to another indicium, said apparatus being improved in that:

(a) it uses a mixture of discrete, visually distinct, symbols consisting of a relatively small group of different symbols,

(b) it has said different symbols allocated and positioned to enable two indicia to be spaced by aligning a symbol on one side of the first indicium with a matching symbol on the other side of the second indicium, and

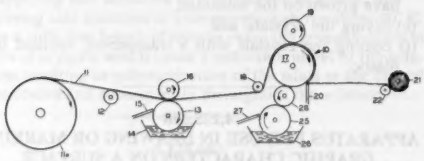
(c) it is provided with at least two different symbols on at least one side of at least some of the indicia to enable a user to obtain automatically a spacing between two consecutive characters related to both the particular characters and the particular character pair combination by selecting from said at least two different symbols on said one side a symbol which matches a symbol on the other side of the next letter and by aligning the matching symbols.

4,125,659

PATTERNED CREPING OF FIBROUS PRODUCTS

Bernard G. Klowak, Neenah; Walter L. Pauls, Appleton, both of Wis., and Frederick J. Vermillon, Jr., Stamford, Conn., assignors to American Can Company, Greenwich, Conn.

Filed Jun. 1, 1976, Ser. No. 691,305
Int. Cl.[2] D21H *5/24;* B31F *1/12*
U.S. Cl. 428—153 **15 Claims**



1. A method of creping a fibrous web in a pattern having differing crepe characteristics comprising the steps of:

(a) uniformly adhering the fibrous web to a smooth creping cylinder without causing substantial compression of the web,

(b) differentially adhering the web to the cylinder with regions of the web enclosed by linear portions having directional components extending axially and circumferentially of the cylinder, which portions have greater adhesion to the cylinder than said regions, by pressing into the web and toward the creping cylinder a raised pattern, and

(c) creping the web by removing the web from the cylinder with a creping blade.

10. In apparatus for producing a creped fibrous web, which apparatus includes a smooth creping cylinder, means for adhering a fibrous web to the creping cylinder, means for pressing portions of the adhered web, and a creping blade for creping the web by removing the web from the cylinder, the improvement which comprises:

raised pattern pressing means for forming regions of the web enclosed by linear portions which have greater adhesion to the cylinder than said regions, the pressing means comprising a surface for pressing into the web toward the creping cylinder a raised pattern having directional components extending axially and circumferentially of said cylinder.

4,125,660

ZERO PRESSURE DEVICE SUCH AS TIRES OR RUN-FLAT RINGS

John R. White, Wadsworth; Frank J. Murray, Cuyahoga Falls, and Cletus A. Becht, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 17, 1976, Ser. No. 751,936
Int. Cl.[2] C08G *18/48, 18/14*
U.S. Cl. 428—218 A **5 Claims**

1. A zero pressure device composed of a microcellular polyurethane foam having an average density of 60 to 65 pounds per cubic foot for a run-flat device and 30 to 42 pounds per cubic foot for a tire and a center portion having a density less than the density of the outer skin of said device, said microcellular polyurethane being a reaction product of 8.4 to 22.7 mols of an organic polyisocyanate with at least three polyols, each of said three polyols being characterized as follows: 5.2 to 17.8 mols of a polyol of 2 to 3 hydroxyls having a molecular weight of less than 250, 1.2 to 3.2 mols of a polyester polyol of 2 to 3 hydroxyls having a molecular weight of 800 to 3000 and a mol of a polyether polyol of 2 to 3 hydroxyls having a molecular weight of 4000 to 7000, said organic polyisocyanate being selected from the class consisting of solid and liquid methylene-di(phenylene isocyanate) containing sufficient carbodiimide groups to give an isocyanate functionality of 2.1 to 2.3.

2. The zero pressure device of claim **1** wherein the device is a microcellular tire having a skin with more density than the center portion thereof.

4,125,661

LAMINATED PLATES FOR CHEMICAL MILLING

Harold J. Messerschmidt, Jr., Stockholm, and Karl Heyman, Montclair, both of N.J., assignors to Mona Industries, Inc., Paterson, N.J.

Continuation of Ser. No. 668,568, Mar. 19, 1976, abandoned. This application Dec. 2, 1977, Ser. No. 857,350
Int. Cl.[2] B41N *1/00;* B32B *15/08, 27/38;* G03C *1/94*
U.S. Cl. 428—201 **11 Claims**

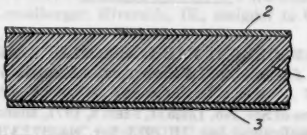
1. Composite photoengraving plate for printing comprising a layer of magnesium metal having a thickness of from 10 to 250 thousandths of an inch and a surface layer of a presensitized coating for exposing and developing a photoengraving image, and adhered to the bottom of said magnesium metal layer, by means of an adhesive layer impervious to development chemicals, a continuous plastic film having a thickness of from 1 to 5 thousandths of an inch, wherein the ratio of the magnesium metal thickness to the plastic film thickness is from 3:1 to 70:1.

4,125,662

PACKAGING FILM WITH IMPROVED HEAT SEALABILITY

Milton L. Weiner, Rochester; Peter Breidt, Jr., Webster, and Thomas W. Higgins, Penfield, all of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 3, 1977, Ser. No. 839,054
Int. Cl.[2] B32B *27/32*
U.S. Cl. 428—213 **4 Claims**



1. A multiple-layer, heat-sealable film comprising:

(a) a substrate layer which is substantially a homopolymer or copolymer of propylene, said substrate having a first and a second surface; and

(b) on at least one of said surfaces, a layer formed from a

member of the group consisting of butene-1 homopolymer and a copolymer of butene-1 with ethylene in which the ethylene content is 0.25% to 10% by weight.

4,125,663

ARTICLE AND PROCESS FOR THE MANUFACTURE OF A CARRIER WEB

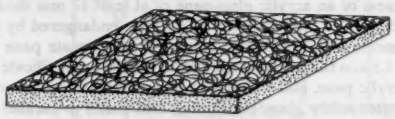
Peter Eckardt, Hofheim am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 2, 1977, Ser. No. 792,862

Claims priority, application Fed. Rep. of Germany, May 3, 1976, 2619087; May 3, 1976, 7613886[U]

Int. Cl.[2] D04H *1/58*

U.S. Cl. 428—288 **6 Claims**



1. *In a process* for the production of a carrier web of a spun bond consisting of synthetic polyester filaments having a melting point of more than 230°C and a filament titer of approximately 3 to 15 dtex, bonded by approximately 10 to 30% by weight, calculated on the unbonded spun bond, of a chemical binder, by applying the same to the spun bond in the form of an aqueous dispersion and hardening by drying at approximately 120 to 220°C, *the improvement which comprises using an* aqueous dispersion *comprising*

(a) 10 to 60% by weight consisting of a copolymer of 60 to 90% by weight of styrene, 5 to 20% by weight of butadiene, 2 to 10% by weight of acrylic acid and 2 to 10% by weight of acrylamide,

(b) 5 to 30% by weight, calculated on the amount of copolymer, of a melamine formaldehyde precondensate, *and*

(c) a catalytic amount of acid catalyst[s, as well as, optionally,

(d) further inert additives].

4,125,664

SHAPED ARTICLES OF FOAM PLASTICS

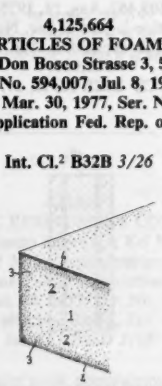
Herbert Giesemann, Don Bosco Strasse 3, 5300 Bonn, Germany

Continuation of Ser. No. 594,007, Jul. 8, 1975, abandoned. This application Mar. 30, 1977, Ser. No. 782,817

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1974, 2433724

Int. Cl.[2] B32B *3/26*

U.S. Cl. 428—310 **12 Claims**



1. Shaped part comprising a rigid foam of a material of the group urea formaldehyde and melamine formaldehyde, which material is at least partially of open cell structure and has a density of 5 to 150 kgs/cu.m., the cells of the foam material adjoining the periphery of at least one external surface of the shaped part being impregnated with a silicate, said external surface being coated with a silicate lacquer which forms a continuous top coat, and a reinforcing sheet material bonded to the top coat, said impregnating silicate, top coat, and reinforcing sheet material improving fire proofness, and compressive, tensile, and flexural strength of the foam.

4,125,665

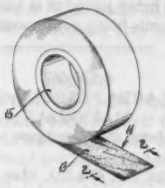
CONTAINER SEALING TAPE

Cyrus W. Bemmels, North Brunswick; Richard A. Mumber, and Thomas J. Schirripa, both of Edison, all of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Aug. 29, 1977, Ser. No. 828,402

Int. Cl.[2] B32B *15/08, 15/20, 27/36, 27/32*

U.S. Cl. 428—352 **8 Claims**



1. A pressure-sensitive adhesive container sealing tape which comprises a backing laminate, a pressure-sensitive adhesive layer on one of the major surfaces of the laminate and a release coating on the other major surface of the laminate, said tape being wound upon itself to form a roll with the pressure-sensitive adhesive layer facing inwardly toward the axis of the roll; said laminate comprising a first polyester film and a second polyester film laminated to one another through a reflective inner layer which comprises either,

(a) a thin layer of metal coated onto one major surface of said first film to metallize said surface and a laminating adhesive layer adhering the second film to the metallized surface of the first film, or

(b) a laminating adhesive layer containing metallic reflective material and adhering said first and second films to one another;

said pressure sensitive adhesive layer consisting essentially of the following components the proportions of which are expressed in parts per one hundred parts by weight of the elastomeric component:

(1) an elastomeric component comprising about 35–65 parts of each of S-I-S and S-B-S linear or radial thermoplastic and elastomeric block copolymers wherein the S-blocks are thermoplastic and are derived from styrene or styrene homologues and the I-blocks and the B-blocks are elastomeric and are derived from isoprene and butadiene, respectively;

(2) about 20–50 parts of a relatively high melting point tackifier resin; and

(3) about 10–35 parts of a relatively low molecular weight S-block associating bonding resin.

4,125,666

TEAM LATTICE FIBERS

George C. Brumlik, Montclair, N.J., assignor to Ingrip Fasteners, Inc., Montclair, N.J.

Division of Ser. No. 515,792, Oct. 17, 1974, Pat. No. 4,017,659. This application Jan. 13, 1977, Ser. No. 759,147

Int. Cl.[2] D02G *3/00*

U.S. Cl. 428—370 **19 Claims**

1. A composite textile continuous mono-filament consisting essentially of at least two components in mutual contact, a first component of said two components having at least in part a

straight portion, a second component of said two components having at least in part an undulated portion, said first and

second components being joined at at least two points, at least one of said components being continuous.

4,125,667

HIGH SURFACE AREA FERROMAGNETIC CARRIER MATERIALS

Lewis O. Jones, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 474,623, May 30, 1974, Pat. No. 4,040,969. This application Feb. 11, 1977, Ser. No. 767,873

The portion of the term of this patent subsequent to Aug. 9, 1994, has been disclaimed.

Int. Cl.[2] G03G *9/02*

U.S. Cl. 428—403 **9 Claims**

1. Classified high surface area ferromagnetic carrier materials for electrostatographic developer mixtures employed in magnetic brush development apparatus, said carrier materials having been classified as to have a specific surface area of at least about 150 cm^2/gram, a particle size volume distribution geometric standard deviation of less than about 1.3, and a particle size distribution wherein said carrier particles have an average particle diameter of less than about 100 microns, said carrier materials being further characterized as exhibiting improved triboelectric properties when mixed with finely-divided toner particles.

4,125,668

LUBRICANTS COMPRISING DIALKANOLAMINE DERIVATIVES

Robert P. Pardee, Boulder, Colo., assignor to Ball Brothers Research Corporation, Boulder, Colo.

Division of Ser. No. 722,175, Sep. 10, 1976, Pat. No. 4,071,460. This application Aug. 15, 1977, Ser. No. 824,890

Int. Cl.[2] C10M *1/32*; G11B *3/00*

U.S. Cl. 428—409 **9 Claims**

1. A substrate having dynamic presentations thereon consisting of an essentially non-volatile N-alkyl-substituted N,N-dialkanolamine.

4,125,669

BULLETPROOF LAMINATED SAFETY GLASS AND PROCESS FOR PRODUCTION

Wolfgang Triebel, Hanau; Siegfried Hari, Klein-Welzheim; Hubbert Koert, Hanau, and Fritz Evers, Münster, all of Germany, assignors to Deutsche Gold-und Silber-Scheideanstalt Vormals Roessler, Frankfurt am Main, Germany

Filed Feb. 15, 1977, Ser. No. 768,800

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1976, 2606569

Int. Cl.[2] B32B *27/36*

U.S. Cl. 428—412 **16 Claims**

1. A bulletproof laminated safety glass comprising:

(1) a silicate glass pane of at least 6 mm thickness provided for the side of the laminated safety glass endangered by bombardment, or an acrylic glass pane of at least 12 mm thickness; and

(2) a polycarbonate pane of at least 1.5 mm thickness which is thin relative to the silicate glass or acrylic pane, and which is provided for the rear side of the combination said glass pane and said polycarbonate pane being secured together along their planar surface area by an adhesive layer, which is produced in situ by hardening at temperatures between +10° and +50° C. of a binder which comprises in the uncured state at least 50% by weight from 2-ethylhexylmethacrylate, 0.2 to 2.0% by weight of the binder of at least one alkylacylperoxide and 0.005 to 0.5% by weight of the binder at least a compound which contains a labile halogen atom, as a solution in a phlegmatization agent, 0.01 to 10 ppm Cu^{++}-ions in the form of a copper salt, soluble in the binder, and 0.05 to 3% by weight of said binder of a ω-mercaptoalkyl-trialkoxy silane.

9. A process for the production of a laminated safety glass comprising providing a silicate glass pane of at least 6 mm thickness or an acrylic glass pane of at least 12 mm thickness for the side of the laminated safety glass endangered by bombardment, and further providing a polycarbonate pane of at least 1.5 mm thickness which is thin relative to the silicate glass or acrylic pane, and which is provided for the rear side of the laminates safety glass, positioning said panes in parallel relationship and connecting said panes by means of an adhesive layer, which is an adhesive layer produced in situ by hardening of a binder comprising at least 50% by weight 2-ethylhexylmethacrylate, 0.2 to 2.0% by weight of at least one alkylacylperoxide and 0.005 to 0.5% by weight of at least a compound which contains a labile halogen atom, as a solution in a phlegmatization agent, 0.01 to 10 ppm Cu^{++}-ions in the form of a copper salt, soluble in the binder and 0.05 to 3% by weight of a ω-mercaptoalkyl-trialkoxy silane, all weight being by weight of the binder, said binder hardening at a temperature between +10 and +50° C.

4,125,670

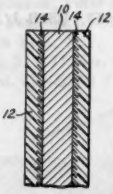
THERMOSETTING ORGANIC COATED METALLIC SHEET

Guido A. Perfetti, and Henry Darlington, both of Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Division of Ser. No. 603,462, Aug. 11, 1975, Pat. No. 4,032,678, which is a continuation-in-part of Ser. No. 505,302, Sep. 12, 1974, abandoned. This application Apr. 12, 1977, Ser. No. 786,907

Int. Cl.[2] B32B *15/18, 27/16*

U.S. Cl. 428—626 **5 Claims**



1. A coated sheet metal for use in manufacturing drawn and ironed seamless containers consisting essentially of a metallic substrate coated with a thermosetting organic coating which has been heated for a time to effect a partial cure in the range of between about 1 and about 75% MEK insoluble residue, which cure provides a bond between the coating and the metallic substrate and a coating with the ability to elongate with the metallic substrate without becoming detached from the metallic substrate in a drawing and ironing operation.

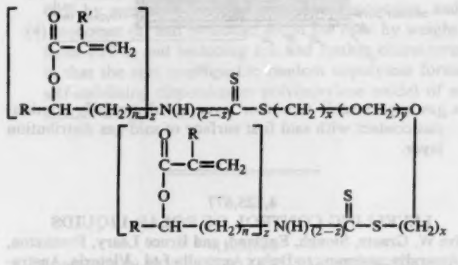
4,125,671

ACRYLATED DITHIOCARBAMYL ESTERS

Joseph J. Magazzu, Levittown, Pa., assignor to Thiokol Corporation, Newtown, Pa.

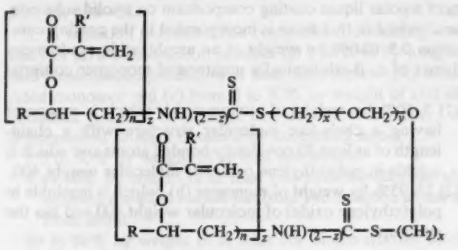
Filed May 6, 1977, Ser. No. 794,495
Int. Cl.[2] B32B *27/06, 27/40*
U.S. Cl. 428—419 15 Claims

1. An article of manufacture which comprises a substrate coated on at least one surface thereof with a cured film derived from a radiation curable polyurethane prepolymer and a compound of the Formula:



wherein R is hydrogen, or lower alkyl of 1 to about 10 carbon atoms; R′ is hydrogen or methyl; *x* is an integer of from 2 to about 10; *y* is 0 or 1; *z* is 1 or 2; and *n* is an integer of from 1 to about 10.

2. A compound of the formula:



wherein R is hydrogen, or lower alkyl of 1 to about 10 carbon atoms; R′ is hydrogen or methyl; *x* is an integer of from 2 to about 10; *y* is 0 or 1; *z* is 1 or 2; and *n* is an integer of from 1 to 10.

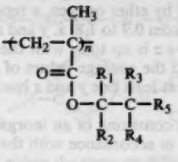
4,125,672

POLYMERIC RESIST MASK COMPOSITION

Masami Kakuchi; Shungo Sugawara; Kei Murase, and Kentaro Matsuyama, all of Mito, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Jan. 19, 1977, Ser. No. 760,374
Claims priority, application Japan, Jan. 23, 1976, 51/5827
Int. Cl.[2] B05D *3/06*
U.S. Cl. 428—421 8 Claims

1. A polymeric resist mask composition thinly coated on a semiconductor substrate, wherein prescribed portions of said resist mask are exposed to high energy rays such as electron beams, X-rays, or ultraviolet rays for degradation, and the degraded portions of the resist mask are removed by an organic solvent to present a prescribed resist mask pattern on the semiconductor substrate, which comprises a fluorine-containing polymethyl methacrylate whose composition is expressed by the formula



wherein R_1 and R_2 are substituents selected from the group consisting of hydrogen, methyl, ethyl, propyl, chloromethyl, and trifluoromethyl; R_3 and R_4 are substituents selected from the group consisting of hydrogen, methyl and fluorine, and R_5 is a fluoroalkyl radical containing from 1 to 8 carbon atoms, fluorine and bromine, and n indicates an average polymerization degree of from about 100 to about 20,000; and an organic solvent for said fluorine-containing polymethyl methacrylate.

4,125,673

PROCESS AND COMPOSITION FOR RENDERING SURFACES HYDROPHOBIC AND OLEOPHOBIC

Michael Roth, and Herbert Gluck, both of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed May 27, 1976, Ser. No. 690,682
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1975, 2526287
Int. Cl.[2] B05D *3/02;* B32B *9/04*
U.S. Cl. 428—447 35 Claims

1. A process for imparting hydrophobic and oleophobic properties to surfaces of bricks or tiles consisting of an inorganic material having open pores, which comprises applying to the surface component (a) which is selected from the class consisting of a fluorine-containing organic polymer and a water soluble polymer of an unsaturated carboxylic acid and a diluent, and component (b) which is a solution of an organosilicon compound having an average of from 0.9 to 1.8 hydrocarbon radicals per silicon atom and any unsatisfied silicon valences are satisfied by an oxygen atom, said organosilicon compound is selected from the group consisting of (i) monomeric hydrocarbon siliconates of the formula

$$RSi(OR)_2OM,$$

and

polymeric siliconates thereof having units of the formula

(ii) organosilanes of the formula

$$R^1_n Si(OR^2)_{4-n},$$

and partial hydrolyzates thereof having not more than 10 silicon atoms per molecule, (iii) an organopolysiloxane containing more than 10 carbon atoms per molecule and consisting of units of the formula

$$R^1_x Si(OR^2)_y(OH)_zO_{\frac{4-x-y-z}{2}}, \text{ and}$$

(iv) a product obtained from the reaction of a silane having the formula

$$R^1_n SiCl_{4-n}$$

and a glycol selected from the class consisting of ethylene glycol and diethylene glycol, in which M is an alkali metal, R is selected from the class consisting of an alkyl radical having up to 5 carbon atoms and a phenyl radical, R^1 is a hydrocarbon radical free of aliphatic unsatruation having up to 14 carbon

atoms, R^2 is an alkyl radical having up to 5 carbon atoms which may be interrupted by ether oxygen, n represents 1, 2 or 3 and has an average of from 0.9 to 1.8, x, y and z represent 0, 1, 2 or 3, the sum of $x+y+z$ is up to 3, with the average value of x being 0.9 to 1.8 and the average values of y and z is from 0.00 to 0.20 except that at least one y and z has an average value of at least 0.01.

2. Bricks or tiles consisting of an inorganic material having open pores treated in accordance with the process of claim 1.

4,125,674

ALUMINUM FOIL FOR AN ELECTRODE OF AN ELECTROLYTIC CAPACITOR

Tohru Kimura, Nara; Osamu Iwao, Ashiya; Masahiko Kawai, Daito, and Hiroshi Tanimoto, Nara, all of Japan, assignors to Toyo Aluminium Kabushiki Kaisha, Osaka, Japan

Filed Mar. 17, 1976, Ser. No. 667,618

Claims priority, Application Japan, Mar. 28, 1975, 50-38852, 50-38853, May 19, 1975, 50-61406

Int. Cl.[2] B32B *15/04*

U.S. Cl. 428—469 **8 Claims**

1. An aluminum foil adapted to be used as an electrode of an electrolytic capacitor composed of three layers including two outer layers which contains etch pits on the outer surfaces thereof and an inner core layer sandwiched therebetween which is substantially free of etch pits, said aluminum foil being produced by bringing together three aluminum sheet ingots, the outer ingots of which have a purity of 99.9% or higher, rolling the ingots into the form of a foil, annealing the thus-produced foil and then electrolytically etching the sheet.

4,125,675

COLOR DEVELOPING SHEET WITH ORGANIC DEVELOPER AND LATEX BINDER

Sadao Sekiguchi, Minoo; Kojiro Matsumoto, Takarazuka; Tetsuo Ishikawa, Ibaraki; Saburo Mishiba, and Nobujiro Izaki, both of Niihama, all of Japan, assignors to Sumitomo Naugatuck Co., Ltd., Osaka, Japan

Filed Nov. 26, 1976, Ser. No. 745,261

Claims priority, application Japan, Nov. 28, 1975, 50-142498

Int. Cl.[2] B32B *27/06, 23/08, 23/10;* B41M *5/16*

U.S. Cl. 428—483 **13 Claims**

1. A color developer sheet sensitized in a color developing property on contact with a chromogenic material comprising a support sheet and a color developer layer comprising an organic color developer and a binder provided on a surface of the said support sheet, wherein the binder is a latex of a copolymer prepared by polymerization of a mixture consisting essentially of about 20 to 70% by weight of at least one aliphatic conjugated diolefin monomer, about 0.5 to 15% by weight of at least one unsaturated carboxylic acid monomer and about 15 to 79.5% by weight of at least one other copolymerizable olefin monomer, said copolymer having a gel content of about 95 to 100% by weight.

4,125,676

CARBON FOAM FUEL CELL COMPONENTS

Donald L. Maricle, Glastonbury, Conn., and Dennis C. Nagle, Catonsville, Md., assignors to United Technologies Corp., Hartford, Conn.

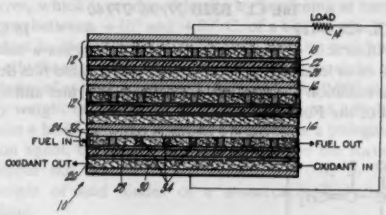
Filed Aug. 15, 1977, Ser. No. 824,759

Int. Cl.[2] H01M *4/96*

U.S. Cl. 429—38 **10 Claims**

1. In a fuel cell comprising an anode catalyst layer spaced apart from a cathode catalyst layer, the space therebetween adapted to have electrolyte disposed therein, and wherein said fuel cell operates on gaseous reactants, the improvement comprising:

a gas distribution layer having first and second opposing surfaces, said second surface being in substantially continuous contact with one of said catalyst layers, said gas distribution layer including a first layer of open cell vitreous carbon foam, said foam layer being gas porous, sufficiently thick and including enough pores sufficiently large to permit a substantially free flow of a reactant gas through said pores both perpendicular to and parallel to the planes of said surfaces, said first layer being at least 80% porous; and



a gas impermeable separator layer in substantially continuous contact with said first surface of said gas distribution layer.

4,125,677

LEVELLING CONTROL OF POLAR LIQUIDS

Clive W. Graetz, Slough, England, and Bruce Leary, Frankston, Australia, assignors to Dulux Australia Ltd., Victoria, Australia

Filed Apr. 29, 1977, Ser. No. 792,112

Claims priority, application Australia, May 3, 1976, PC5775

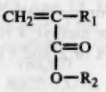
Int. Cl.[2] B32B *27/30*

U.S. Cl. 428—500 **10 Claims**

1. A process of modifying the levelling characteristics of a film of a polar liquid coating composition on a solid substrate, characterised in that there is incorporated in the coating composition 0.5–60.0% by weight of an amphipathic random copolymer of α, β-ethylenically unsaturated monomer comprising;

(1) 5–50% by weight of monomer (a), which is monomer having a chain-like molecular structure with a chain-length of at least 80 covelently bonded atoms and which is soluble in poly(ethylene oxide) of molecular weight 400,

(2) 25–95% by weight of monomer (b), which is insoluble in poly(ethylene oxide) of molecular weight 400 and has the structure



wherein

R_1 is H or CH_3 and

R_2 is a chain-like moiety of chain length at least 10 covalently bonded atoms,

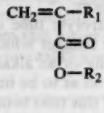
(3) monomer (a) plus monomer (b) to the extent of at least 60% by weight of the total unsaturated monomer, and

(4) monomer (a) and monomer (b) in the ratio by weight of from 1 : 19 to and including 1 : 1; and further characterised in that the said amphiphatic random copolymer forms a self-stabilising dispersion in poly(ethylene oxide) of molecular weight 400.

6. A film on a solid substrate of a polar liquid coating composition, characterised in that the coating composition comprises 0.5–60.0% by weight of an amphiphatic random copolymer of α, β-ethylenically unsaturated monomer comprising;

(1) 5–50% by weight of monomer (a), which is monomer having a chain-like molecular structure with a chain-length of at least 80 covalently bonded atoms and which is soluble in poly(ethylene oxide) of molecular weight 400,

(2) 25–95% by weight of monomer (b), which is insoluble in poly(ethylene oxide) of molecular weight 400 and has the structure



wherein

R_1 is H or CH_3 and

R_2 is a chain-like moiety of chain length at least 10 covalently bonded atoms,

(3) monomer (a) plus monomer (b) to the extent of at least 60% by weight of the total unsaturated monomer, and

(4) monomer (a) and monomer (b) in the ratio by weight of from 1:19 to and including 1:1; and further characterised in that the said amphipathic random copolymer forms a self-stabilising dispersion in poly(ethylene oxide) of molecular weight 400.

4,125,678

RADIATION POLYMERIZABLE COMPOSITIONS

Otto J. Stvan, Frankfort, and Mary G. Brodie, Chicago, both of Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Continuation of Ser. No. 395,302, Sep. 7, 1973, abandoned. This application Dec. 15, 1976, Ser. No. 750,999

Int. Cl.[2] C08F *2/54, 2/50*

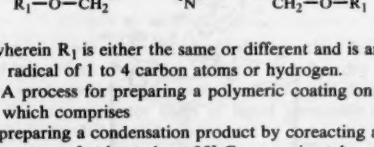
U.S. Cl. 428—514 **40 Claims**

1. A radiation polymerizable composition consisting essentially of (a) a condensation product (b) 0 to 90% by weight of said condensation product of at least one ethylenically unsaturated monomer and (c) from 0 to 50% by weight of said condensation product of at least one radiation sensitizer; said condensation product obtained by coreacting about

1.0 to 80% by weight of at least one polyol,

4 to 70% by weight of at least one hydroxy-alkyl acrylate wherein the alkyl radical has from 1 to 6 carbon atoms and from about

10 to 81% by weight of at least one amino-triazine having the formula:



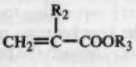
wherein R_1 is either the same or different and is an alkyl radical of 1 to 4 carbon atoms or hydrogen.

18. A process for preparing a polymeric coating on a substrate which comprises

(a) preparing a condensation product by coreacting at temperatures of at least about 25° C. approximately

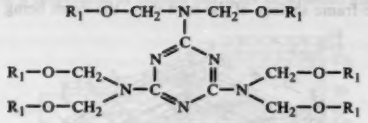
1.0 to 80% by weight of at least one polyol,

4 to 70% by weight of at least one hydroxy-alkyl acrylate having the formula



wherein R_2 is either hydrogen, halogen or an alkyl group of 1 to 2 carbon atoms and R_3 is a hydroxy-alkyl radical having 1 to 6 carbon atoms.

10 to 81% by weight of at least one amino-triazine having the formula:



wherein R is either the same or different and is an alkyl radical of 1 to 4 carbon atoms or hydrogen,

(b) preparing a mixture consisting essentially of said condensation product and 0 to 90% by weight thereof of at least one ethylenically unsaturated monomer and 0 to 50% by weight thereof of at least one sensitizer and subsequently

(c) coating said mixture onto a substrate and polymerizing the coating with the radiation of light or electrons until cured.

4,125,679

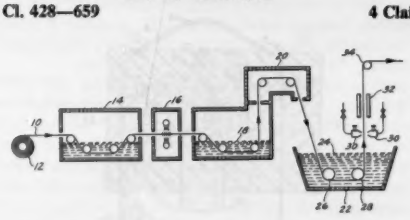
PARTIALLY ALLOYED GALVANIZE PRODUCT

George M. Mino, Hamburg, and Donald L. Dustin, Elma, both of N.Y., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Division of Ser. No. 686,961, May 14, 1976, Pat. No. 4,059,711. This application Jul. 25, 1977, Ser. No. 818,796

Int. Cl.[2] C23C *1/02*

U.S. Cl. 428—659 **4 Claims**



1. A hot dipped glavanized ferrous product having a duplex coating characterized by

(a) a coating weight of between 0.2 and 0.5 oz. per square foot,

(b) an iron content, by weight, of at least 2% but less than 4%, and

(c) a surface layer of free zinc overlying an iron-zinc intermetallic layer of predominantly the zeta phase.

4,125,680

BIPOLAR CARBON-PLASTIC ELECTRODE STRUCTURE-CONTAINING MULTICELL ELECTROCHEMICAL DEVICE AND METHOD OF MAKING SAME

Joseph A. Shropshire, Westfield, and Hsue C. Tsien, Livingston, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Aug. 18, 1977, Ser. No. 825,605

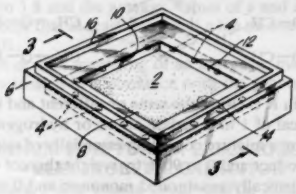
Int. Cl.[2] H01M *6/48*

U.S. Cl. 429—4 **7 Claims**

1. A multicell electrochemical device, comprising:

a plurality of bipolar carbon-plastic electrode structures and a plurality of electrochemical cell elements, each of said structures and elements being circumscribed by a dielectric plastic frame having a front surface and a back surface, at least one surface of which contains a projection thereon, each of said structures and said elements being situated in a stacked arrangement with one another to form a group of items in an electrochemical cell-functional arrangement so that the projection of the frame of each item contacts a frame surface of the next item in the stack, each of said items being joined to the next item in

the stack by being sealed where each projection contacts the frame surface of the next item, the items being sealed



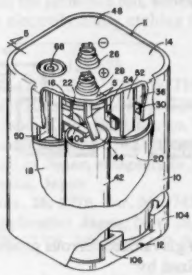
so as to form a continuous multicell electrochemical device having voids therein capable of holding liquid.

4,125,681

RECHARGEABLE BATTERY ENCLOSURE

Axel O. Sjogren, Littleton, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Nov. 3, 1976, Ser. No. 738,417
Int. Cl.[2] H01M *2/10*
U.S. Cl. 429—99 **4 Claims**



1. In a battery construction comprising an enclosure, a plurality of self-contained electrochemical cells electrically interconnected and housed in cell-to-cell contact within the enclosure and a pair of output terminals mounted on the enclosure, an improved enclosure comprising:

a top closure having an uppermost surface;

a bottom closure spaced from the top closure; and

a side closure surrounding the electrochemical cells and mounted to the top and bottom closures;

said bottom closure having a generally planar bottommost surface from which project a plurality of discrete upstanding locator stops positioned inwardly of the side closure and upstanding less than the height of the cells, the side walls of said cells being in direct physical contact with one another said stops, together with the side closure, limiting lateral movement of the cells relative to the enclosure.

4,125,682

SODIUM-SULPHUR ELECTRIC CELL

Philippe Bordet, La Ville du Bois, and Alain Le Méhauté, Gif sur Yvette, both of France, assignors to Compagnie General d'Electricite, Paris, France

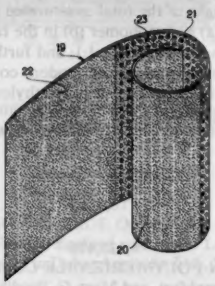
Filed Oct. 11, 1977, Ser. No. 841,080
Claims priority, application France, Oct. 22, 1976, 76 31890
Int. Cl.[2] H01M *10/39*
U.S. Cl. 429—104 **4 Claims**

1. An electric cell comprising:

a cathode tank containing a cathode reagent which is liquid at the operation temperature and chosen from the group consisting of sulphur, phosphorus, selenium and alkaline salts of these substances;

at least one solid electrolyte tube closed at its lower end containing an anode reagent which is liquid at operation temperature consisting of an alkaline metal and disposed in said cathode tank so as to be immersed in said cathode reagent, the walls of this tube being made of beta alkaline alumina;

an insulating ceramic support for holding said electrolyte tube in said cathode tank, a glass part connecting said support and said tube together;



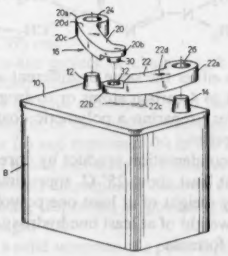
an anode tank containing a stock of said anode reagent and disposed above said cathode tank, said electrolyte tube opening at its upper part into said anode tank, said support separating the open ends of said anode tank and of said cathode tank, and said cathode tank being lined with a means for cathode collection of the current generated, the improvement wherein said collection means comprises a continuous strip wound in a spiral, one end of said strip being in contact with the wall of said cathode tank, at least one of the turns of said spiral having a plurality of holes through its whole thickness.

4,125,683

ADJUSTABLE BATTERY STACKING SPACER

Murray D. Beckford, Cascade; Roy E. Hennen, Mequon, and Van D. Wells, Wauwatosa, all of Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Filed Nov. 9, 1977, Ser. No. 849,958
Int. Cl.[2] H01M *2/10*
U.S. Cl. 429—121 **10 Claims**



1. An adjustable battery supporting spacer for use in connection with batteries of the type having a pair of battery terminal posts extending upwardly through the battery cover with such batteries in vertically stacked relation, the spacer comprising a pair of arms each having opposite ends and each having a lower surface at least a portion of which is to be received against the cover of a first battery and each having an upper surface for supporting a second battery, said pair of arms each having a first end, the first ends being pivotably joined to-

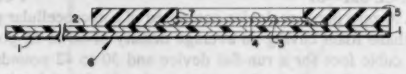
gether, each of said arms having a second end including an aperture therein for receiving a battery terminal post therein, the aperture of said arms generally having parallel longitudinal axes and extending from said lower surface toward said upper surface, and means for pivotably joining together the first ends of the arms.

4,125,684

ELECTRICAL CELLS AND BATTERIES

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 30, 1977, Ser. No. 811,468
Int. Cl.[2] H01M *4/06, 4/12*
U.S. Cl. 429—122 **7 Claims**



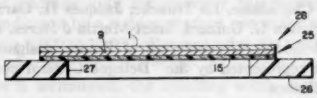
1. An electrode terminal subassembly, comprising a thin, flat metal terminal sheet, a thin, flat current collector sheet of conductive plastic conductively adhered to said terminal sheet, a thin, flat dry patch electrode adhered to a predetermined region of the surface of said current collector within the peripheries of said current collector, a thin, flat separator over said electrode and extending beyond the boundaries of said electrode over adjacent regions of said current collector within said peripheries, and an insulating frame over said current collector and said separator, said frame being formed with a central aperture in registry with said electrode and smaller than said separator, and said frame being adhered to regions of said current collector beyond the boundaries of said separator.

4,125,685

ELECTRICAL CELLS AND BATTERIES AND METHODS OF MAKING THE SAME

Stanley M. Bloom, Waban; Charles K. Chiklis, Lexington, and Gordon F. Kinsman, Billerica, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 30, 1977, Ser. No. 811,469
Int. Cl.[2] H01M *4/06, 4/12*
U.S. Cl. 429—122 **27 Claims**



1. An electrode subassembly, comprising a thin, flat sheet of liquid impervious conductive plastic, a thin, flat, dry layer of active anode particles adhesively bonded to said sheet, and a thin, flat, dry separator sheet of liquid permeable material adhesively bonded to said anode layer.

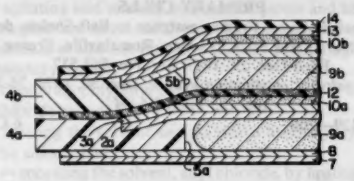
4,125,686

LAMINAR CELLS AND METHODS FOR MAKING THE SAME

Gordon F. Kinsman, Billerica, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 30, 1977, Ser. No. 811,470
Int. Cl.[2] H01M *6/12*
U.S. Cl. 429—152 **2 Claims**

1. In an electrical cell, the combination comprising a thin sheet of ion permeable separator material; a first electrolyte permeable layer of active electrode particles held together with a polymeric binder on said separator sheet; said first layer having aqueous electrolyte distributed therein; a layer comprising a dispersion of carbon particles in aqueous electrolyte



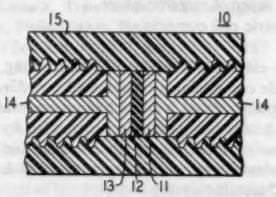
on said first layer, and a conductive plastic sheet over and in contact with said second layer.

4,125,687

RECHARGEABLE NONAQUEOUS CELL WITH CHALCOGENIDE ELECTRODE

Francis J. Di Salvo, Jr., Florham Park, and Donald W. Murphy, Warren, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 27, 1977, Ser. No. 810,176
Int. Cl.[2] H01M *6/14*
U.S. Cl. 429—194 **5 Claims**



1. A nonaqueous secondary cell comprising a negative electrode comprising at least one element selected from the group consisting of lithium and sodium, an electrolyte, and a positive electrode containing active positive electrode material, characterized in that said active positive electrode material consists essentially of a layered chalcogenide having the nominal atom composition $M_xN_{1-x}S_2$, in which M is selected from the group consisting of Mn, Fe, Ni and Co and mixtures thereof and N is selected from the group consisting of V and Cr and mixtures thereof and in which x is less than or equal to a maximum value of 0.5 when N is V and M is Fe, and x is less than or equal to a maximum value of 0.33 when N is V and M is Ni, Co or Mn, and x is less than a maximum value of 0.33 when N is Cr said maximum value scaling linearly with atom percent.

4,125,688

NEGATIVE ELECTRODES FOR ELECTRIC CELLS

Raymond Bonnaterre, Bordeaux, France, assignor to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France

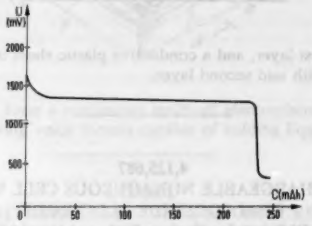
Filed Jun. 14, 1977, Ser. No. 806,352
Claims priority, application France, Jun. 24, 1976, 76 19224
Int. Cl.[2] H01M *4/24, 10/30*
U.S. Cl. 429—206 **4 Claims**

1. An electrode for use in an alkaline electrolyte, the main material of the electrode being nickel lanthanide, wherein the improvement comprises said electrode containing in addition a mercury compound, said mercury compound added to said nickel lanthanide being mercury oxide, HgO.

4,125,689
POSITIVE ACTIVE MATERIAL FOR ELECTRIC PRIMARY CELLS

Yves Jumel, Poitiers, France, assignor to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed Dec. 29, 1977, Ser. No. 865,517
Claims priority, application France, Dec. 30, 1976, 76 39572
Int. Cl.[2] H01M 6/04
U.S. Cl. 429—206 6 Claims



1. Positive active material for primary electric cells in the form of a powder, wherein the powder comprises grains having cores of silver peroxide, each core being entirely surrounded by an intermediate layer of monovalent silver oxide, and the layer of monovalent silver oxide being covered with a thin surface layer of metallic silver.

5. An electric cell comprising

a casing;

a positive electrode contained in said casing, said positive electrode comprising a compressed powder, at least some of the grains of said powder having cores of silver peroxide, each core being entirely surrounded by an intermediate layer of monovalent silver oxide and the layer of monovalent silver oxide being covered with a thin surface layer of metallic silver;

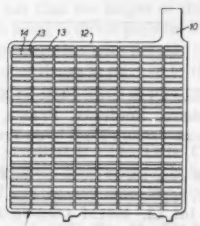
a zinc negative electrode contained in said casing; and

an aqueous alkaline electrolyte contacting the grains of said positive electrode.

4,125,690
BATTERY ELECTRODE STRUCTURE

Norman E. Bagshaw, Marple Bridge, and John McWhinnie, Bolton, both of England, assignors to Chloride Group Limited, London, England

Filed Mar. 3, 1977, Ser. No. 774,030
Claims priority, application United Kingdom, Mar. 5, 1976, 9011/76; Dec. 16, 1976, 52678/76
Int. Cl.[2] H01M 4/14; C22C 11/02
U.S. Cl. 429—226 5 Claims



1. A battery electrode structure made of a lead-calcium-tin alloy consisting essentially of 0.081 to 0.099% by weight calcium, 0.4 to 0.7% by weight tin and 0.0001% to 0.1% by weight aluminum, the balance being substantially lead, said alloy having a Brinell hardness of at least 12, 2 days after casting to enable the alloy to be automatically trimmed and handled.

4,125,691
ZERO PRESSURE DEVICE SUCH AS TIRES OR RUN-FLAT RINGS

John R. White, Wadsworth, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 1, 1977, Ser. No. 783,902
Int. Cl.[2] C08G 18/10, 18/14, 18/48; C08J 9/34
U.S. Cl. 521—51 4 Claims

1. A zero pressure device composed of a microcellular polyurethane foam having an average density of 60 to 65 pounds per cubic foot for a run-flat device and 30 to 42 pounds per cubic foot for a tire and a center portion having a density less than the density of the outer skin of said device, said microcellular polyurethane being a reaction product of an organic polyisocyanate with at least three polyols, each of said three polyols being characterized as follows: a polyol of 2 to 3 hydroxyls having a molecular weight of less than 250, a polyether triol having a molecular weight of 4600 to 6000 and a polyether diol having a molecular weight of 3500 to 4200, said organic polyisocyanate being selected from the class consisting of solid and liquid methylene-di(phenylene isocyanate) and a methylene-di(phenylene isocyanate) containing sufficient carbodiimide groups to give an isocyanate functionality of 2.1 to 2.3, said organic polyisocyanate being reacted with the polyether triol to form a quasi prepolymer, said quasi prepolymer then being reacted with the other polyols.

4,125,692
PROCESS FOR PRODUCING A MACROMOLECULAR COMPOUND HAVING A FUNCTIONAL GROUP AT EACH END OF THE MOLECULE

Hervé M. Cheradame, La Tronche; Jacques H. Garapon, Eybens; Christian G. Guizard, Saint-Martin d'Heres, and Maryvonne Brigodiot, Grenoble, all of France, assignors to Etat Francais represented by the "Delegue General pour l'Armement", France

Filed May 13, 1977, Ser. No. 796,593
Claims priority, application France, May 31, 1976, 76 16290
Int. Cl.[2] C08F 8/50, 8/42
U.S. Cl. 526—48.3 13 Claims

1. A process for making a macromolecular compound having at least two terminal groups, each of which is independently selected from the group consisting of carbonylic and carboxylic acid groups, said macromolecular compound being produced from a polymer containing at least 2 carbon-carbon double bonds, said polymer being capable of being cleaved at each of said carbon-carbon double bonds and being selected from the group consisting of a partially hydrogenated homopolymer of conjugated diene, a copolymer of a monoolefin and a conjugated diene, and a chlorinated or fluorinated homopolymer or copolymer which contains residual carbon-carbon double bonds on the polymer chain which comprises:

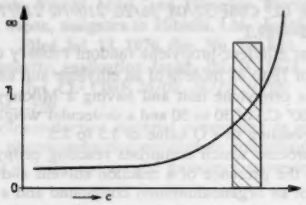
contacting in solution said polymer with ruthenium tetroxide in the presence of ruthenium dioxide and a co-oxidizing agent capable of oxidizing in situ ruthenium dioxide to ruthenium tetroxide.

4,125,693

PROCESS FOR THE PRODUCTION OF POLYURETHANES DISSOLVED IN A SOLVENT AND ALSO THEIR USE FOR THE PRODUCTION OF FABRICATED SHAPES, ESPECIALLY OF MICROPOROUS STRUCTURES

Karl-Heinz Hilterhaus, Georgsmarienhutte/Oesede, Germany, assig..or to Chemie-Anlagenbau Bischofsheim GmbH, Osnabruck and Metallgesellschaft AG, Frankfurt am Main, both of, Fed. Rep. of Germany

Continuation of Ser. No. 518,045, Oct. 25, 1974, abandoned. This application Feb. 28, 1977, Ser. No. 775,629
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1973, 2355073
Int. Cl.[2] C08G *18/10, 18/32, 18/82;* C08J *9/28*
U.S. Cl. 521—63 4 Claims



1. A process for making partially cross-linked polyurethanes dissolved in an organic highly polar solvent comprising reacting by continuously adding and mixing at a temperature between 20° C. and 40° C.

(1) a linear pre-adduct having a molecular weight of 5000 to 10,000 and having from 1.5 to 5% by weight free isocyanate groups that has been prepared by reacting an excess of an organic diisocyanate with an organic compound having two reactive hydrogen-containing groups dissolved in an organic highly polar solvent, the solids content of the resulting solution being 60 to 80% by weight pre-adduct, into

(2) a cross-linking agent selected from the group consisting of hydrazine hydrate and carbodihydrazide in an organic highly polar solvent for the reactants and the resulting partially cross-linked polyurethanes in a concentration of 0.02 to 0.05 mole per cent

with continuous measuring of the viscosity of the solution during the addition until the viscosity has reached a range which is indicated by a sudden marked rise in the viscosity to a value from 6,000 to 10,000 cP measured at the reaction conditions and after reaching this range the addition of the linear pre-adduct is terminated, the resulting solids content of the solution of partially cross-linked polyurethanes being between 25 and 35% by weight.

4. The process of claim 1 characterized in that the viscous solution of partially cross-linked polyurethanes is used to form shaped articles which are then directly coagulated in a water-bath which is free of any additive.

4,125,694

PROCESS FOR THE POLYMERIZATION OF ALLYL HALIDES TO FORM POLYALLYL ALCOHOL

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Division of Ser. No. 757,239, Jan. 6, 1977, which is a division of Ser. No. 622,525, Oct. 15, 1975, and a continuation-in-part of Ser. No. 551,534, Feb. 21, 1975, which is a continuation-in-part of Ser. No. 71,628, Sep. 11, 1970, abandoned. This application Nov. 9, 1977, Ser. No. 849,855
Int. Cl.[2] C08F *8/12, 8/26, 14/02*
U.S. Cl. 526—47.7 8 Claims

1. The process for the production of poly(allyl alcohol) polymer by the following steps:

(a) mixing 1 part by weight of granular silicon acid with 2 parts by weight of an allyl halide;

(b) agitating said mixture in a closed system and keeping the temperature between 0° to 100° C. for about 20 to 40 minutes at ambient pressure, thereby producing poly(allyl halide) polymer;

(c) dissolving poly(allyl halide) polymer with a solvent, allyl chloride monomer;

(d) filtering the solvent and poly(allyl halide) polymer from the silicon acid;

(e) evaporating the solvent, allyl chloride, by heating, thereby recovering the poly(ally halide) polymer;

(f) adding 2 to 4 parts by weight of water and 1 mol of alkali compound per mol of halide in the poly(allyl halide) polymer;

(g) heating said mixture to 80° to 100° C. while agitating for about 30 to 45 minutes, thereby producing poly(allyl alcohol) polymer;

(h) filtering off water and salt; thereby

(i) recovering poly(allyl alcohol) polymer.

4,125,695

POLYMERIZATION PROCESS WITH REDUCED CYCLE TIME EMPLOYING POLYFUNCTIONAL FREE RADICAL INITIATORS

Vasanth R. Kamath, Tonawanda, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 6, 1977, Ser. No. 757,187
Int. Cl.[2] C08F *2/00, 4/28, 4/04*
U.S. Cl. 526—73 12 Claims

1. A process for the free radical polymerization of vinyl monomers, including vinyl aromatic monomers, comprising polymerizing said monomer wherein the temperature of the polymerization is progressively increased by at least 30° C during the period of the polymerization in a temperature range of from 50° C to 160° C and wherein the final temperature is at least 110° C, the polymerization mass including an initiator sensitive to produce free radicals near or at the low temperature end of the range and an initiator sensitive to produce free radicals near or at the high temperature end of the range, wherein at least one of the initiators is a polyfunctional free radical initiator, and the resulting polymer has a unimodal molecular weight distribution.

4,125,696

POLYMERIZATION PROCESS USING DI-T-BUTYL DIPEROXYCARBONATE AS A FINISHING CATALYST

Vasanth R. Kamath, Tonawanda, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 6, 1977, Ser. No. 757,188
Int. Cl.[2] C08F *2/00, 4/34, 4/38, 112/08*
U.S. Cl. 526—73 5 Claims

1. A process for the free-radical polymerization of a vinyl monomer, including vinyl aromatic monomer, comprising polymerizing said monomer at at least two distinct, progressively higher polymerization temperatures, each between the temperatures of from about 50° C. to 130° C., in the presence of at least two free-radical initiators, one of which, used in relatively minor proportions as a finishing catalyst, is a di-t-butyl piperoxycarbonate and the other, has a ten hour half-life temperature below 90° C., wherein the same solvent is used for measuring the half life of all initiators, wherein the time to produce polymer without more than 0.1 weight percent residual monomer can be reduced by as much as 20% of the time required if the di-t-butyl diperoxycarbonate finishing initiator were not present.

4,125,697
PROCESS FOR THE PRODUCTION OF POLYCHLOROPRENE

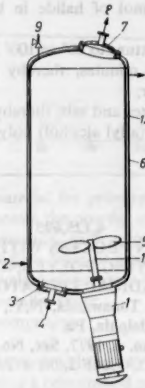
Hans-Jürgen Pettelkau, Burscheid; Bodo Ehrig; Karl Nöthen, both of Dormagen, and Dietrich Rosahl, Munich, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 683,473, May 5, 1976, abandoned. This application Sep. 30, 1977, Ser. No. 838,294

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1976, 2650714

Int. Cl.[2] **C08F** *2/22, 114/14*

U.S. Cl. 526—88 **11 Claims**



1. A process for the heatemitting polymerisation of chloroprene in aqueous emulsion by means of a radical initiator wherein polymerisation is carried out in a closed, cylindrical, vertically arranged reactor with a length-to-diameter ratio of (2–30):1, a smooth interior surface, rounded corners, which is substantially surrounded by a heat exchange jacket and which is equipped with at least one propeller stirring means having an axis of rotation inclined at an angle of from 0 to 45° C. with respect to the vertical, the reactor being substantially completely filled during polymerisation and its contents being circulated by the propeller stirring means with an effective circulation volume of from 5 to 20 m^3/min. per cubic meter of reactor volume at a relatively low speed of rotation whereby shearing and coagulation of the aqueous emulsion are avoided, the absorption of heat of polymerisation by the heat exchange jacket is promoted and popcorn polymerisation is prevented.

4,125,698
POLYMERIZATION OF ETHYLENICALLY UNSATURATED HYDROCARBONS

Karl Ziegler; Heinz Breil; Heinz Martin, and Erhard Holzkamp, all of Mulheim, au der Ruhr, Germany, assignors to Studiengesellschaft Kohle M.b.h. Mulheim, Ruhr, Germany

Continuation of Ser. No. 482,412, Jan. 17, 1955, abandoned, and Ser. No. 527,413, Aug. 9, 1955, abandoned, and Ser. No. 514,068, Jun. 8, 1955. This application Oct. 29, 1958, Ser. No. 770,484

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1953, Z 3799; Dec. 15, 1953, Z 3862; Dec. 23, 1953, Z 3882; Jan. 19, 1954, Z 3941; Aug. 3, 1954, Z 4348; Aug. 16, 1954, Z 4375; Dec. 11, 1954, Z 4603; Dec. 13, 1954, Z 4604

Int. Cl.[2] **C08F** *4/66, 10/00*

U.S. Cl. 526—159 **15 Claims**

1. Method for the production of high molecular polymers which comprises contacting an alpha-olefin with a catalyst formed by a mixture of a first and second component, said first component essentially consisting of an aluminum compound of the general formula RR'AlX, in which R and R' are each a member selected from the group consisting of hydrogen, alkyl radicals and aryl radicals, and X is a member selected from the group consisting of hydrogen, halogen atoms, alkoxy radicals, and aryloxy radicals, said second component essentially consisting of a non-ionized heavy metal compound selected from the group consisting of salts and freshly precipitated oxides and hydroxides of metals of Groups IV-B, V-B and VI-B of the Periodic System including thorium and uranium, metals of Group VIII of the Periodic System and manganese, and recovering the high molecular polymer formed.

4,125,699
ETHYLENE-PROPYLENE RUBBERY COPOLYMER

Akira Yamamoto; Masao Shiraishi; Masakatu Isozumi, and Masato Yoshikawa, all of Yokkaichi, Japan, assignors to Japan EP Rubber Co., Ltd., Japan

Filed May 17, 1977, Ser. No. 797,855

Claims priority, application Japan, May 21, 1976, 51-57893

Int. Cl.[2] **C08F** *32/08, 36/20, 210/16, 210/18*

U.S. Cl. 526—169.2 **7 Claims**

1. A linear ethylene-propylene random rubbery copolymer composed of 78 to 85 mole% of an ethylene unit and 15 to 22 mole% of a propylene unit and having a Mooney viscosity (ML_{1+4}, 100° C.) of 30 to 50 and a molecular weight distribution corresponding to a Q value of 3.5 to 5.5.

5. In a process which comprises reacting propylene with ethylene in the presence of a reaction solvent and a catalyst composed of an organoaluminum compound and a vanadium compound to produce an ethylene-propylene rubbery copolymer composed of 78 to 85 mole% of an ethylene unit and 15 to 22 mole% of a propylene unit, the improvement wherein the catalyst is composed of an organoaluminum compound and a vanadic acid ester of the general formula

$$VO(OR)_nX_{3-n}$$

wherein R is an alkyl group containing 6 to 12 carbon atoms, n is an integer of 1 to 3, and X is chlorine or bromine, the aluminum/vanadium atomic ratio being 2 to 6, and the amount of the catalyst being 0.6×10^{-3} to 2.0×10^{-3} gram-atom, as vanadium, per liter of the reaction solvent.

4,125,700
PREPARATION OF METHYL METHACRYLATE POLYMER POWDERS FOR USE IN PLASTISOLS

Boynton Graham, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 22, 1977, Ser. No. 780,088

Int. Cl.[2] **C08F** *2/50, 2/22;* **C08K** *5/04;* **C08F** *232/00*

U.S. Cl. 204—159.16 **17 Claims**

1. In an emulsion polymerization process for the preparation of methyl methacrylate polymers and copolymers containing at least 60% by weight of methyl methacrylate units, which comprises (a) adding stepwise in two or more steps with vigorous mixing in water at least one monomer which is methyl methacrylate, together with a polymerization initiator and chain transfer agent whereby at least most of the monomer added in any given step is consumed before the addition of the next succeeding portion, and (b) isolating the resulting polymer; the improvement which comprises the stepwise addition in step (a) occurring in the absence of any emulsifier and surfactant, and the isolation step (b) occurring at a temperature that is at least 30° C. below the glass transition temperature of the polymer product.

13. A process for the preparation of photosensitive plastisols and organosols which comprises

(1) preparing methyl methacrylate polymers and copolymers containing at least 60% by weight of methyl methacrylate units by an emulsion polymerization process which comprises

(a) adding stepwise in two or more steps with vigorous mixing in water, in the absence of any emulsifier and surfactant, at least one monomer which is methyl methacrylate, together with a polymerization initiator and

chain transfer agent whereby at least most of the monomer added in any given step is consumed before the addition of the next succeeding portion, and

(b) isolating the resulting polymer at a temperature that is at least 30° C. below the glass transition temperature of the polymer product; and

(2) dispersing said isolated polymers and copolymers in a surfactant-free medium that comprises a compatible liquid plasticizer that is nonvolatile at room temperature and is not a monomer of any of the polymeric components, a photopolymerizable ethylenically unsaturated monomeric compound, and at least one photoinitiator.

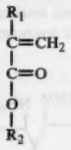
4,125,701

ORGANIC PHOTOCONDUCTIVE MATERIALS

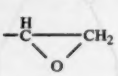
Akio Mukoh; Yasuki Mori, and Hirosada Morishita, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 13, 1976, Ser. No. 704,964
Claims priority, application Japan, Jul. 19, 1975, 50-87852
Int. Cl.[2] C08F *26/06, 26/12, 10/00*
U.S. Cl. 526—259 **9 Claims**

1. A photoconductive material comprising as an active ingredient a photoconductive copolymer consisting of 3 to 50 mole % of at least one acrylic monomer represented by the formula



wherein R_1 is hydrogen or methyl; and R_2 is a group of the formula $-C_nH_{2n+1}$ or a group of the formula $+CH_2\rightarrow_m X$, wherein n is an integer of 0 to 18; m is an integer of 1 to 4; and X is a group of the formula $-OR_3$ or



(wherein R_3 is a group of the formula $-C_lH_{2l+1}$; and l is an integer of 0 to 4), and 97 to 50 mole % of a photoconductive monomer having an α,β-unsaturated bond selected from the group consisting of [vinylanthracene,] 9-(p-vinylphenyl)anthracene[, N-vinylcarbazole, vinylacridine] and 9-(p-vinylphenyl)acridine.

4,125,702

ADDITIVE FOR LOW PROFILE POLYMERIZABLE UNSATURATED POLYESTER MOLDING COMPOSITION

Victor F. G. Cooke, Youngstown, and Donald H. Thorpe, Williamsville, both of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Division of Ser. No. 646,112, Jan. 2, 1976, Pat. No. 4,043,988.
This application May 2, 1977, Ser. No. 793,222
Int. Cl.[2] C08F *14/06, 16/08;* C08L *67/06*
U.S. Cl. 526—323 **11 Claims**

1. A low profile additive for polymerizable unsaturated polyester molding compositions which comprises discrete particles of less than about 50 microns diameter of a lightly cross-linked vinyl chloride polymer characterized by a glass transition temperature of below about 100° Celsius, and comprising the polymeric reaction product of vinyl chloride and about 0.1 to about 10 percent by weight of a polyfunctional monomer.

4,125,703

PROCESS FOR THE PRODUCTION OF PHENOL SILICATE COMPOUNDS AND THEIR CONDENSATION PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Filed Oct. 17, 1977, Ser. No. 842,910
The portion of the term of this patent subsequent to Jun. 28, 1994, has been disclaimed.
Int. Cl.[2] C08G *8/04*
U.S. Cl. 528—95 **29 Claims**

1. The process for the production of phenol silicate compounds and their resinous products by the following steps:

(a) mixing about 1 part by weight of fine granular silica (SiO_2) and 1 to 2 parts by weight of a phenol compound;

(b) adding an alkali catalyst in an aqueous solution until the pH is 10 to 12;

(c) heating said mixture to 70° to 120° C. while agitating for 30 to 120 minutes, thereby

(d) producing a granular phenol silicate compound.

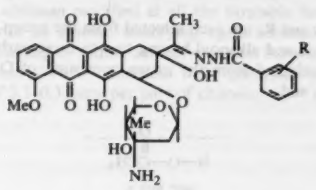
4,125,704

PHENYL-SUBSTITUTED RUBIDAZONE ANALOGS

David W. Henry, Chapel Hill, N.C., and George L. Tong, Cupertino, Calif., assignors to SRI International, Menlo Park, Calif.

Filed Sep. 14, 1977, Ser. No. 833,165
Int. Cl.[2] C07G *3/00*
U.S. Cl. 536—4 **5 Claims**

1. Compounds having the structure



wherein R represents 4-phenyl, 4-chloro, 3,4-dichloro or 3-nitro, and the pharmaceutically acceptable salts of these compounds.

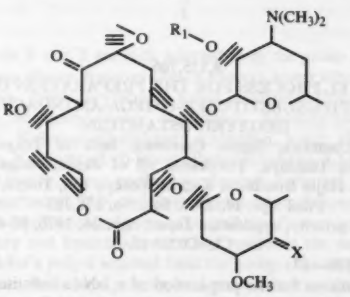
4,125,705

SEMI-SYNTHETIC 4-AMINO-OLEANDOMYCIN DERIVATIVES

Frank C. Sciavolino, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

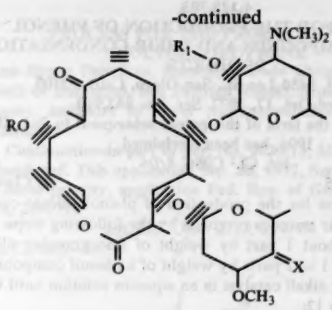
Filed Feb. 4, 1977, Ser. No. 765,486
Int. Cl.[2] C07H *17/06*
U.S. Cl. 536—9 **20 Claims**

1. A compound selected from the group consisting of:



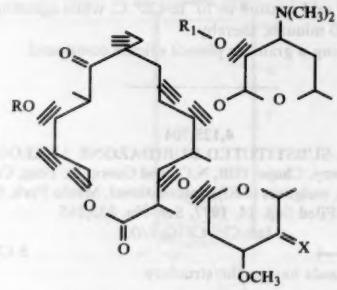
I

-continued



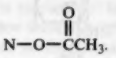
II

and



III

wherein R and R_1 are each selected from the group consisting of hydrogen and alkanoyl having two to three carbon atoms; and X is selected from the group consisting of O, N—OH, N—OCH_3 and



4,125,706

NOVEL PROCESS FOR THE PREPARATION OF 1-N-(ALPHA-SUBSTITUTED-OMEGA-AMINOACYL)-3'-DEOXYRIBOSTAMYCIN

Hamao Umezawa; Sumio Umezawa, both of Tokyo, and Tsutomu Tsuchiya, Yokohama, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

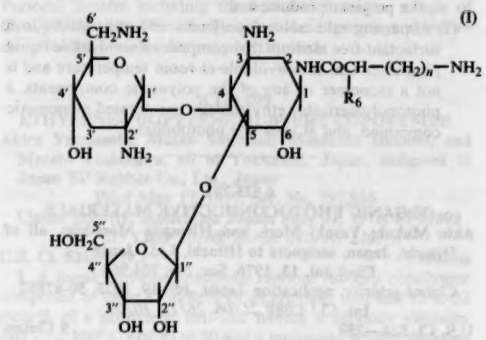
Filed Apr. 14, 1976, Ser. No. 676,792

Claims priority, application Japan, Apr. 24, 1975, 50-49106

Int. Cl.[2] C07H *15/20*

U.S. Cl. 536—17 **7 Claims**

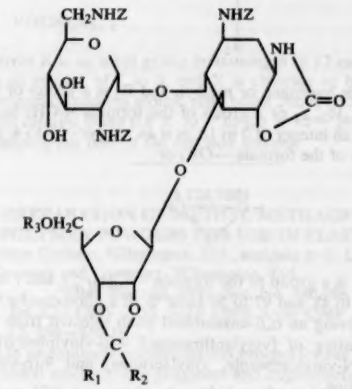
1. A process for the preparation of a 1-N-(α-substituted-ω-aminoacyl)-3'-deoxyribostamycin of the general formula:



(I)

wherein R_6 represents —OH and *n* is an integer of 1 to 4, which comprises the steps of:

reacting a compound of the formula:

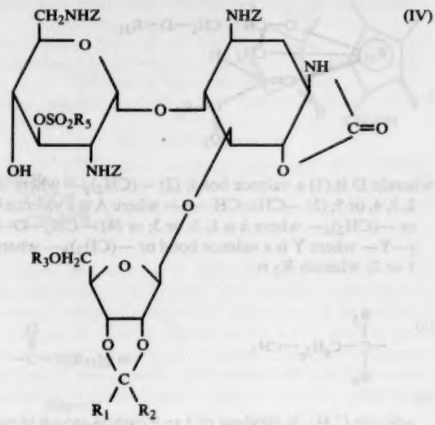


(II)

wherein each of Z represents an amino-protecting group of the formula —$COOR_4$ in which R_4 represents an alkyl, aryl or aralkyl group, R_1 and R_2 which may be the same or different, each represents hydrogen or an alkyl or aryl group or R_1 and R_2 taken together with the adjacent carbon atom form a cycloalkylidene or tetrahydropyranyl group and R_3 represents acetyl, propionyl, butyryl, benzoyl, para-chlorobenzoyl, p-nitrobenzoyl, tetrahydropyranyl, 1-methoxycyclohexyl, ethoxycarbonyl, t-butoxycarbonyl, t-amyloxycarbonyl, benzyloxycarbonyl, p-methoxybenzyloxycarbonyl, p-ethoxybenzyloxycarbonyl or p-chlorobenzyloxycarbonyl, with a sulfonylating compound of the formula:

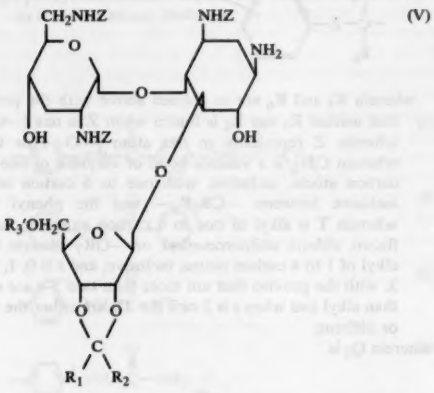
R_5SO_2X (III)

wherein R_5 represents methyl, ethyl, propyl, butyl, benzyl, p-toluyl, o-nitrophenyl, p-nitrophenyl or 2-naphthyl and X represents chlorine or bromine or —OSO_2R_5 group, to produce a sulfonyl compound of the formula:



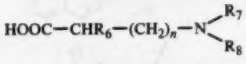
(IV)

wherein Z, R_1, R_2, R_3 and R_5 are as defined above;
reacting said sulfonyl compound with an appropriate halogenating compound to iodinate, chlorinate or brominate the 3'-position of the sulfonyl compound;
subjecting the 3'-halogenated compound to reduction and then to hydrolysis to produce a compound of the formula:



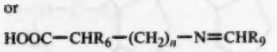
(V)

wherein Z, R_1 and R_2 are as defined above and R_3' represents hydrogen or has the same meaning as R_3;
interacting the compound of the formula (V) with an acylating compound of the formula:



(VI)

or



(VII)

wherein R_6 and n are as defined above, R_7 and R_8 each represents hydrogen or an acyl, alkyloxycarbonyl, aralkyloxycarbonyl or aryloxycarbonyl group and R_9 represents hydrogen or an alkyl or aryl group, or with a functional derivative of the carboxylic acid compound to acylate the 1-amino group of the compound (V); and then removing the remaining amino- and hydroxyl-protecting groups from the acylation product.

4,125,707

PROTECTED PSEUDOTRISACCHARIDE INTERMEDIATE FOR PAROMOMYCIN AND NEOMYCIN DERIVATIVES

Federico Arcamone, Milan, and Giuseppe Cassinelli, Voghera, both of Italy, assignors to Societa' Farmaceutici Italia S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 580,245, May 23, 1975, abandoned. This application Mar. 22, 1977, Ser. No. 780,232
Claims priority, application Italy, May 28, 1974, 23230 A/74
Int. Cl.[2] C07H *15/22*
U.S. Cl. 536—17 **3 Claims**

1. 1,3,6,-N,N,O-triacetyl-5-0-[2,5-di-0-acetyl-3-0-(2,6-diacetamido-3,4-di-0-acetyl-2,6-dideoxy-β-L-idopyranosyl)-β-D-ribofuranosyl]-2-deoxystreptamine.

4,125,708

CHITOSAN MODIFIED WITH ANIONIC AGENT AND GLUTARALDEHYDE

Merle S. Masri, Emeryville, and Virginia G. Randall, El Cerrito, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 15, 1977, Ser. No. 768,820
Int. Cl.[2] C08B *37/08*
U.S. Cl. 536—20 **1 Claim**

1. An insolubilized composition for removing superoxyanion-forming metals from materials containing the same, consisting of chitosan modified at all the titratable basic groups thereof with an anionic modifying agent selected from the group consisting of sulfite, sulfate, chloride, borate, and hexafluoride and further modified with glutaraldehyde in an amount of 0.1–0.3 parts per part of chitosan.

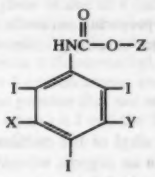
4,125,709

POLYHYDROXY-ALKYL-3,5-DISUBSTITUTED-2,4,6-TRIIODOCARBANILATES

Kenneth R. Smith, Black Jack, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Oct. 4, 1974, Ser. No. 512,004
Int. Cl.[2] C07H *13/12*; A61K *29/02*
U.S. Cl. 536—53 **13 Claims**

1. A compound of the formula:



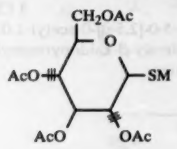
wherein X and Y are each selected from the group consisting of lower alkoxy, hydroxy-(lower alkoxy), lower alkoxy-(lower alkoxy), lower acylamino, lower acylamino-(lower alkyl), lower acylamino-(lower acylamino), hydroxy-lower acylamino, N-(lower alkyl)-lower acylamino, lower alkylsulfonamido, N-(lower alkyl)-lower alkylsulfonamido, 3,3-bis-(lower alkyl)-ureido, lower perfluoroacylamino, carbamyl, N-(lower alkyl)carbamyl, N,N-di-(lower alkyl) carbamyl, lower alkoxy-(lower acylamino), lower alkoxyalkoxy-(lower acylamino), hydroxy and hydroxy-lower alkyl and Z is the monovalent residue of a polyol selected from the group consisting of linear and branched chain polyols, said monovalent residue containing not more than 7 carbon atoms in its chain or ring.

4,125,710
METHOD FOR PREPARING AURANOFIN

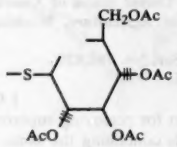
David T. Hill, North Wales, Pa.; Ivan Lantos, Blackwood, N.J., and Blaine M. Sutton, Hatboro, Pa., assignors to Smithkline Corporation, Philadelphia, Pa.

Filed Jun. 30, 1977, Ser. No. 811,794
Int. Cl.[2] C07H *23/00*
U.S. Cl. 536—121 6 Claims

1. The method of preparing auranofin comprising reacting a compound of the formula:



in which M is a stable cation selected from the group consisting of an alkali metal, ammonium, lead, silver or copper cation or



and Ac is acetyl, with a compound of the formula:

$(Et_3P)_2\,AuX$

in which X is a stable common anion selected from the group consisting of a halide, nitrate, thiocyanate, perchlorate, boron tetrafluoride or trifluoroacetate; in a solvent which is inert to the reactants and in which the reactants are soluble.

4,125,711
PROCESS FOR PREPARING AURANOFIN

David T. Hill, North Wales, Pa.; Ivan Lantos, Blackwood, N.J., and Blaine M. Sutton, Hatboro, Pa., assignors to Smithkline Corporation, Philadelphia, Pa.

Filed Jun. 30, 1977, Ser. No. 811,665
Int. Cl.[2] C07H *23/00*
U.S. Cl. 536—121 5 Claims

1. The method of preparing auranofin comprising reacting 1-β-D-thio-2,3,4,6-tetra-O-acetylglucose with a mercaptide of the formula:

$(C_2H_5)_3PAuS—R$

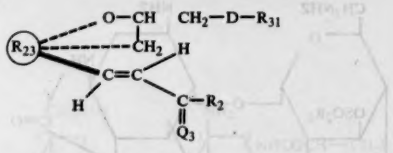
in which R is lower alkyl of 1-8 carbons, benzyl or triethylphosphinegoldthio; in an organic solvent in which the reactants are soluble and which is inert toward the reactants.

4,125,712
CERTAIN 5,6-DIHYDRO-PROSTACYCLIN ANALOGS

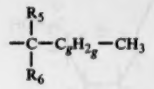
Udo F. Axen, Plainwell, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 788,146, Apr. 19, 1977, abandoned, which is a continuation-in-part of Ser. No. 691,400, Jun. 1, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,236
Int. Cl.[2] C07D *307/93*
U.S. Cl. 542—421 116 Claims

1. A cyclic ether of the formula

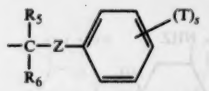


wherein D is (1) a valence bond; (2) $—(CH_2)_d—$ where d is 1, 2, 3, 4, or 5; (3) —CH=CH—A— where A is a valence bond or $—(CH_2)_h—$ where h is 1, 2, or 3; or (4) $—CH_2—O—CH_2—Y—$ where Y is a valence bond or $—(CH_2)_k—$ where k is 1 or 2; wherein R_2 is



(1)

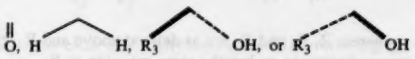
wherein C_gH_{2g} is alkylene of 1 to 9 carbon atoms, inclusive, with 1 to 5 carbon atoms, inclusive, in the claim between $—CR_5R_6—$ and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro; or



(2)

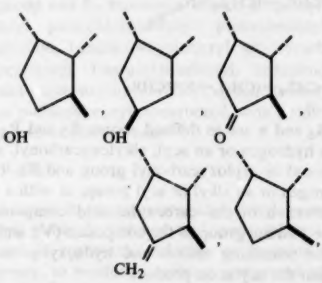
wherein R_5 and R_6 are as defined above with the proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between $—CR_5R_6—$ and the phenyl ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $—OR_7$ wherein R_7 is alkyl of 1 to 4 carbon atoms, inclusive, and s is 0, 1, 2, or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or diffrent;

wherein Q_3 is



wherein R_3 is hydrogen or alkyl of one to 4 carbon atoms, inclusive;

wherein R_{23} is



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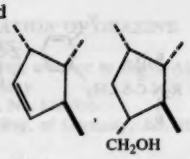
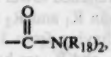
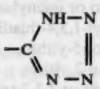


wherein R_{31} is
(1) $-COOR_{32}$
(2) $-CH_2N(R_{18})_2$

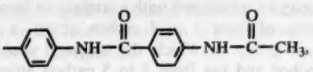


(3)

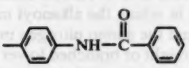


(4)

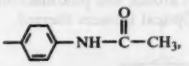
wherein R_{32} is
(a) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(b) aralkyl of 7 to 12 carbon atoms, inclusive
(c) phenyl,
(d) phenyl substituted with 1, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive,



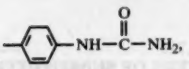
(e)



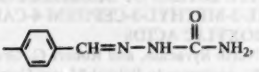
(f)



(g)



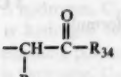
(h)



(i)

, or

(j)



wherein R_{34} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamido phenyl, or 2-naphthyl, wherein R_{35} is hydrogen or benzoyl, and
wherein R_{18} is hydrogen, alkyl of one to 12 carbon atoms, inclusive, benzyl, or phenyl, being the same or different; wherein ~ indicates attachment in alpha or beta configuration; including the lower alkanoates thereof.

4,125,713

CERTAIN 5,6-DIHYDRA-PROSTACYCLIN ANALOGS

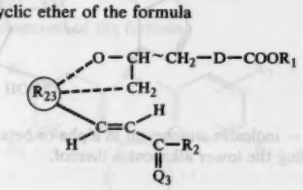
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 788,147, Apr. 19, 1977, abandoned, which is a continuation-in-part of Ser. No. 691,399, Jun. 1, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,203

Int. Cl.[2] C07D *307/93*

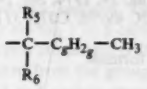
U.S. Cl. 542—426 **72 Claims**

1. A cyclic ether of the formula



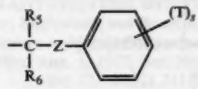
(1)

wherein D is (1) a valence bond; (2) $-(CH_2)_d-$ where *d* is one, 2, 3, 4, or 5; (3) $-CH{=}CH-A-$ where A is a valence bond or $-(CH_2)_h-$ where *h* is one, 2, or 3; or (4) $-CH_2-O-CH_2-Y-$ where Y is a valence bond or $-(CH_2)_k-$ where *k* is one or 2; wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, or a pharmacologically acceptable cation; and wherein R_2 is



(1)

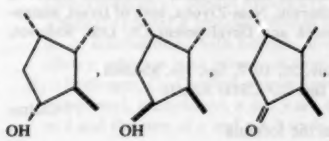
wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to g carbon atoms, inclusive, in the chain between $-CR_5R_6-$ and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or a fluoro; or



(2)

wherein R_5 and R_6 are as defined above with the proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between $-CR_5R_6-$ and the phenyl ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_7-$ wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, and *s* is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl and when *s* is 2 or 3 the T's are either the same or different; wherein Q_3 is

wherein R_3 is hydrogen or alkyl of one to 4 carbon atoms, inclusive;
wherein R_{23} is



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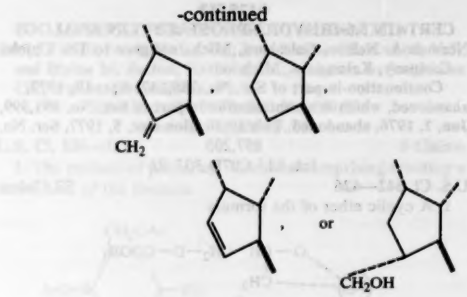


and wherein ~ indicates attachment in alpha or beta configuration; including the lower alkanoates thereof.

4,125,714

ARYL SUBSTITUTED CYCLOALKANONES

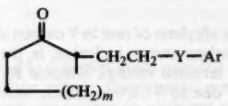
Guy D. Diana, Stephentown, and William B. Hinshaw, Jr., Sand Lake, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 324,540, Jan. 17, 1973, Pat. No. 3,878,200. This application Aug. 29, 1974, Ser. No. 501,770

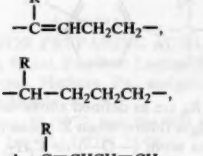
Int. Cl.[2] C07C *49/76;* C07D *317/54*

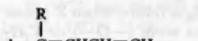
U.S. Cl. 542—429 **4 Claims**

1. A compound of the formula



wherein Y is selected from the group consisting of



and  ;

R is hydrogen or lower-alkyl of 1 to 4 carbon atoms;

m is 1 or 2; and

Ar is phenyl or phenyl substituted by 3,4-methylenedioxy or one or two monovalent substituents selected from the group consisting of lower-alkyl of 1 to 4 carbon atoms, lower-alkoxy of 1 to 4 carbon atoms, halogen, trifluoromethyl and trifluoromethoxy.

4,125,715

7-[(SUBSTITUTED-ISOTHIOUREAMETHYL)PHENYL]-ACETAMIDOCEPHALOSPORIN DERIVATIVES

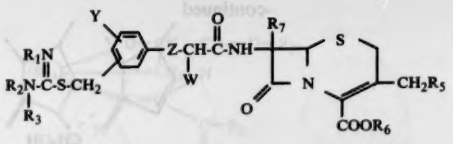
Fortuna Haviv, Wheeling, Ill.; Abraham Nudelman, Rehovot, and Abraham Patchornik, Ness-Ziyona, both of Israel, assignors to Yeda Research and Development Co. Ltd., Rehovot, Israel

Filed Nov. 25, 1977, Ser. No. 854,668

Int. Cl.[2] C07D *501/36*

U.S. Cl. 544—27 **7 Claims**

1. A compound of the formula



wherein Y is hydrogen, chlorine, bromine, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, or an alkoxy group of from 1 to 4 carbon atoms; Z is a bond, oxygen or sulfur; W is hydrogen, methyl, amino, hydroxy, $—SO_3H$ or $—COOR_4$ wherein R_4 is hydrogen or 5-idanyl with the proviso that when Z is oxygen or sulfur, W is other than hydroxy; R_7 is hydrogen or methoxy; each of R_1, R_2 R_3 is hydrogen, amino, formylamino, guanylamino, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, wherein R_1 and R_2 are a concatenated chain of methylene groups having from 3 to 6 methylenes, with the proviso that when R_1 and R_2 are hydrogen or lower alkyl, R_3 is amino, formylamino or guanylamino; R_5 is 1,3,4-thiadiazol-2-ylthio, 5-methyl-1,3,4-thiadiazol-2-ylthio, tetrazol-5-ylthio, 1-methyltetrazol-5-ylthio, 1,3,4-oxadiazol-2-ylthio, 5-methyl-1,3,4-oxadiazol-2-ylthio, 1,3,4-triazol-2-ylthio, 5-methyl-1,3,4-triazol-2-ylthio or 1,2,3-triazol-5-ylthio; R_6 is hydrogen; a cation of an alkali metal or an alkaline earth metal, ammonium a straight or branched lower alkyl group of from 1 to 4 carbon atoms, a straight or branched alkanoyloxymethyl group in which the alkanoyl moiety has from 2 to 5 carbon atoms and is straight or branched, an alkanoylaminomethyl group in which the alkanoyl moiety is straight or branched and has from 2 to 5 carbon atoms and the amine nitrogen may be substituted with a straight or branched lower alkyl group having 1 to 4 carbon atoms; an alkoxycabonylaminomethyl group in which the alkoxy moiety is straight or branched and has from 1 to 4 carbon atoms and the amine nitrogen may be substituted with a straight or branched lower alkyl group of from 1 to 4 carbon atoms, a p-(alkanoyloxy)-benzyl group in which the alkanoyl moiety is straight or branched and has from 2 to 5 carbon atoms; an aminoalkanoyloxymethyl group in which the alkanoyl moiety has from 2 to 15 carbon atoms and the amino nitrogen may be mono- or di-substituted with a straight or branched lower alkyl group having from 1 to 4 carbon atoms; and pharmaceutically acceptable salts and individual optical isomers thereof.

4,125,716

METHOXYMETHYL ESTERS OF SUBSTITUTED IMIDAZOLIDINYL-3-METHYL-3-CEPHEM-4-CARBOXYLIC ACIDS

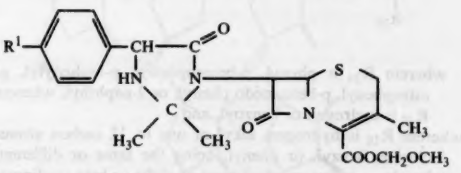
Leonard B. Crast, Jr., North Syracuse, and Robert G. Graham, Syracuse, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Dec. 16, 1977, Ser. No. 861,334

Int. Cl.[2] C07D *501/20*

U.S. Cl. 544—28 **3 Claims**

1. The D form of a compound of the formula



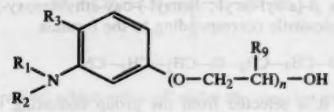
in which R^1 is hydrogen or hydroxy.

4,125,717
PROCESS FOR THE PREPARATION OF OXAZINE DYESTUFFS

Hubertus Psaar, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jul. 6, 1977, Ser. No. 813,316
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1976, 2631166
Int. Cl.[2] C07D *265/34*
U.S. Cl. 544—102 1 Claim

1. Process for the preparation of basic oxazine dyestuffs which comprises nitrosating in aqueous solutions aminophenol ethers of the formula



wherein

R_1 is hydrogen, C_1–C_4-alkyl, C_2–C_3-alkenyl, β-cyanoethyl, β-hydroxyethyl, β-hydroxypropyl, β-chloroethyl, β-C_1-C_4-alkoxyethyl, β-C_1-C_4-alkoxypropyl, or β-carboxamidoethyl;

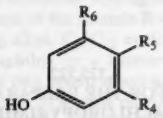
R_2 is C_1–C_4-alkyl, C_2–C_3-alkenyl, β-cyanoethyl, β-hydroxyethyl, β-hydroxypropyl, β-chloroethyl, β-C_1-C_4-alkoxyethyl, β-C_1-C_4-alkoxypropyl, β-carboxamidoethyl, phenyl, benzyl, C_1–C_4-alkylphenyl, C_1–C_4-alkylbenzyl, halophenyl, halobenzyl, C_1–C_4-alkoxyphenyl, or C_1–C_4-alkoxybenzyl;

R_3 is hydrogen, C_1–C_4-alkyl, or C_1–C_4-alkoxy;

R_9 is hydrogen, methyl, or ethyl; and

n is 1 or 2;

and subjecting the nitrosated reaction products without isolation from the reaction medium to a condensation reaction with phenols of the formula



wherein

R_4 is hydrogen or

;

R_5 is hydrogen, C_1–C_4-alkyl, or C_1–C_4-alkoxy;

R_6 is hydrogen or, when joined together with R_5 is the remaining portion of a benzene ring;

R_7 is hydrogen, C_1–C_4-alkyl, C_2–C_3-alkenyl, β-cyanoethyl, β-hydroxyethyl, β-hydroxypropyl, β-chloroethyl, β-C_1-C_4-alkoxyethyl, β-C_1-C_4-alkoxypropyl, or β-carboxamidoethyl; and

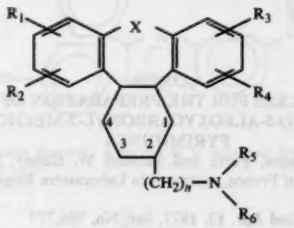
R_8 is hydrogen, C_1–C_4-alkyl, C_2–C_3-alkenyl, β-cyanoethyl, β-hydroxyethyl, β-hydroxypropyl, β-chloroethyl, β-C_1-C_4-alkoxyethyl, β-C_1-C_4-alkoxypropyl, β-carboxamidoethyl, phenyl, benzyl, C_1–C_4-alkylphenyl, C_1–C_4-alkylbenzyl, halophenyl, halobenzyl, C_1–C_4-alkoxyphenyl, or C_1–C_4-alkoxybenzyl.

4,125,718
AMINO-SUBSTITUTED TETRACYCLIC COMPOUNDS

Willem J. van der Burg, Heesch, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

Continuation of Ser. No. 651,759, Jan. 23, 1976, abandoned, which is a division of Ser. No. 463,636, Apr. 24, 1974, Pat. No. 3,950,425. This application Nov. 15, 1977, Ser. No. 851,770
Claims priority, application Netherlands, May 2, 1973, 7306069
Int. Cl.[2] C07D *413/06, 313/10*
U.S. Cl. 544—145 27 Claims

1. A compound of the formula:



I

or a pharmaceutically acceptable salt thereof, in which

X represents the group consisting of oxygen and sulphur,

R_1, R_2, R_3 and R_4 are selected from the group consisting of hydrogen, hydroxy, halogen, alkyl having 1 to 6 carbon atoms, alkoxy having 1 to 6 carbon atoms, alkylthio having 1 to 6 carbon atoms and trifluoromethyl,

R_5, R_6 are selected from the group consisting of hydrogen, alkyl having 1 to 6 carbon atoms, aralkyl having 7 to 10 carbon atoms, and together in combination with the nitrogen atom a morpholine ring,

n is selected from 0, 1 and 2, and

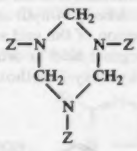
the dotted line signifies an optional bond.

4,125,719
1,3,5-S-HEXAHYDROTRISUBSTITUTED TRIAZINES

Nathaniel Grier, Englewood, and Bruce E. Witzel, Rahway, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 1, 1977, Ser. No. 820,506
Int. Cl.[2] C07D *251/04*
U.S. Cl. 544—215 13 Claims

1. A compound having the formula:



where each Z is R_3 or

where

R_1 is hydrogen, C_1–C_8 alkyl, C_1–C_8 hydroxyalkyl, C_1–C_8 alkoxyloweralkyl, phenyl loweralkyl, phenyl and phenyl where the phenyl is monosubstituted with nitro, or mono-, di- or trisubstituted with halogen, loweralkyl and loweralkoxy; where n is an integer of from 1 to 3;

R_2 is hydrogen, C_1–C_8 alkyl, phenyl loweralkyl, and phenyl, halophenyl, nitrophenyl, x and y are each integers from 0 to 4 and the sum of x and y is 0 to 4; provided, however,

that if the sum of x and y is 0, R_2 is other than hydrogen, and

R_3 is hydroxyloweralkyl, and C_1–C_8 alkyl, provided no more than one Z is R_3.

4,125,720

PROCESS FOR THE PREPARATION OF 4-CHLORO-5-ALKOXYCARBONYL-2-METHOXY-PYRIMIDINES

Marcel E. Pesson, Paris, and Suzanne W. Geiger, Montmorency, both of France, assignors to Laboratoire Roger Bellon, France

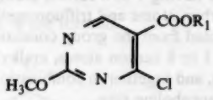
Filed Apr. 12, 1977, Ser. No. 786,777

Claims priority, application France, Apr. 16, 1976, 76 11448

Int. Cl.[2] C07D *239/24*

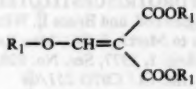
U.S. Cl. 544—318 **4 Claims**

1. Process for the preparation of a 4-chloro-5-alkoxycarbonyl-2-methoxy-pyrimidine of the formula:

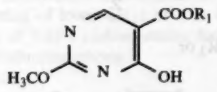


in which R_1 is alkyl of 1 to 4 carbon atoms, which comprises:

(A) condensation of a salt of O-methylisourea and an inorganic or organic acid, with an alkyl alkoxymethylene-malonate

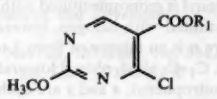


in an aqueous medium and in the presence of an excess of an alkali metal hydroxide, to form the corresponding salt of the 5-alkoxycarbonyl-4-hydroxy-2-methoxy-pyrimidine, and neutralisation of the said salt by the addition of an inorganic or organic acid in order to liberate this 5-alkoxycarbonyl-4-hydroxy-2-methoxy-pyrimidine of formula:



and

(B) bringing this compound, suspended in dimethylformamide, into contact with thionyl chloride, at room temperature, in order to form the corresponding 4-chloro-5-alkoxycarbonyl-2-methoxy-pyrimidine of formula:



4,125,721

PROCESS FOR THE PRODUCTION OF 2,4-DIAMINO-5-(3',4',5'-TRIMETHOXYBENZYL)-PYRIMIDINE

Walter Liebenow, Nuremberg, and Jaroslav Prikryl, Erlangen-Bruck, both of Germany, assignors to Ludwig Heumann & Co. GmbH, Nuremberg, Germany

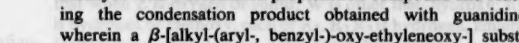
Filed Aug. 1, 1977, Ser. No. 820,413

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1976, 2635765

Int. Cl.[2] C07D *239/48*

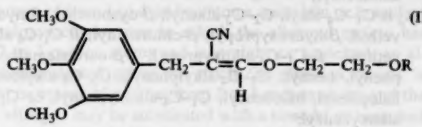
U.S. Cl. 544—325 **3 Claims**

1. A process for the production of 2,4-diamino-5-(3',4',5'-trimethoxybenzyl)-pyrimidine by condensing trimethoxy benzaldehyde with a substituted propionitrile compound and reacting the condensation product obtained with guanidine, wherein a β-[alkyl-(aryl-, benzyl-)-oxy-ethyleneoxy-] substituted propionitrile corresponding to the formula



(I)

in which R is selected from the group consisting of alkyl, phenyl, phenyl subsituted by a halogen atom, a nitro group, a lower alkyl group or an alkoxy group and benzyl, is condensed with trimethoxy benzaldehyde in the presence of basic reagents to form a compound corresponding to the general formula



(II)

in which R is as defined above, and the condensation product (II) obtained is reacted with guanidine [in known manner] to form 2,4-diamino-5-(3',4',5'-trimethoxybenzyl)-pyrimidine.

4,125,722

PROCESS FOR THE PREPARATION OF TETRACHLOROPYRIMIDINE

Gunther Beck, and Helmut Heitzer, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

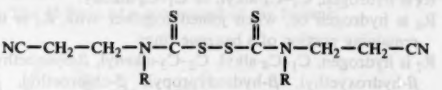
Filed Oct. 17, 1977, Ser. No. 842,976

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1976, 2647313

Int. Cl.[2] C07D *239/24*

U.S. Cl. 544—334 **5 Claims**

1. Process for the preparation of tetrachloropyrimidine, characterised in that compounds of the formula



wherein

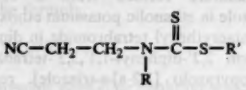
R = C_1-C_4-alkyl, optionally substituted by chlorine, C_1-C_4-alkoxy or phenyl are reacted with a chlorinating agent selected from the group consisting of chlorine, sulfur dichloride, sulfuryl chloride and phosphorus pentachloride at temperatures from 0°–150° C. and using more than 7 mols of chlorinating agent.

4,125,723
PROCESS FOR THE PREPARATION OF TETRACHLOROPYRIMIDINE

Gunther Beck, and Helmut Heitzer, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 14, 1977, Ser. No. 851,309
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1976, 2653616
Int. Cl.[2] C07D *239/24*
U.S. Cl. 544—334 7 Claims

1. A process for the preparation of tetrachloropyrimidine in which a (2-cyanoethyl)-dithiocarbamic ester of the formula



wherein

R is a radical which splits off under the reaction conditions; and

R' is C_1-C_4-alkyl; or C_1-C_4-alkyl substituted by chlorine, C_1-C_4-alkoxy or phenyl; is reacted at a temperature of 0° to 150° C. with chlorine or an agent which releases chlorine under the reaction conditions, in which the amount of chlorine is more than 7.5 mols per mol of said (2-cyanoethyl)-dithiocarbamic acid ester.

4,125,724
HYDROGENATION PROCESS

Henry G. Howell, East Syracuse, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 645,001, Dec. 29, 1975, abandoned. This application Oct. 6, 1977, Ser. No. 839,947
Int. Cl.[2] C07D *241/20*
U.S. Cl. 544—336 3 Claims

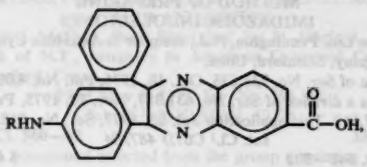
1. In the process of reducing an isocyanate functional group —N=C=O to a formamide functional group -NH-CHO, the improvement which comprises hydrogenating a monisocyanate organic compound of the formula R—N=C=O wherein R represents C_1-C_{20} alkyl, C_3-C_{12} cycloalkyl, aryl selected from phenyl and naphthyl or a heterocyclic group which contains one or more ring hetero atoms selected from oxygen and nitrogen in addition to at least on ring carbon atom and which is linked to the nitrogen atom of the isocyanate moiety through a ring carbon atom, said R group being unsubstituted or substituted by C_1-C_6 alkyl, C_1-C_6 alkoxy, phenyloxy, naphthyloxy, halo, trifluoromethyl, C_1-C_6 alkanoyloxy, C_1-C_6 alkanoylamino, carb(C_1-C_6)alkoxy, C_1-C_6 alkoxycarbonyl C_1-C_6 alkyl or phenyl, with a platinum or pallodium catalyst in an inert aprotic organic solvent in the presence of a catalytic amount of a tertiary amine for a time sufficient to produce the corresponding formamide compound of the formula R—N-H—CHO.

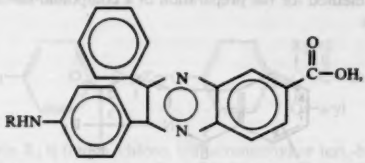
4,125,725
PHENYLATED CARBOXYQUINOXALINES

James V. Duffy, Beltsville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 674,254, Apr. 6, 1976, abandoned. This application Jun. 3, 1977, Ser. No. 803,333
Int. Cl. C07d *241/42*
U.S. Cl. 544—353 13 Claims

1. A compound selected from the group consisting of





and mixtures thereof, wherein R is selected from the group consisting of

and H.

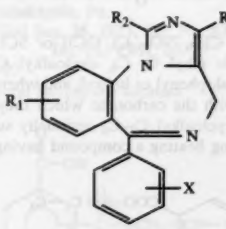
13. A mixture of 3-(p-acetamidophenyl)-2-phenyl-6-carboxyquinoxaline, 3-(p-acetamidophenyl)-2-phenyl-7-carboxyquinoxaline, 3-(p-aminophenyl)-2-phenyl-6-carboxyquinoxaline, and 3-(p-aminophenyl)-2-phenyl-7-carboxyquinoxaline.

4,125,726
IMIDAZO[1,5-a][1,4]BENZODIAZEPINES

Armin Walser, West Caldwell; Rodney I. Fryer, North Caldwell, and Louis Benjamin, Livingston, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 11, 1977, Ser. No. 776,820
Int. Cl.[2] C07D *487/04*
U.S. Cl. 548—302 2 Claims

1. A compound of the formula



wherein R_1 is hydrogen, halogen or trifluoromethyl, R_2 is selected from the group consisting of lower alkylthio together with the sulfoxide and sulfone thereof, halo, lower alkylamino or lower alkoxy; R_3 is selected from the group consisting of hydrogen, —$COOR_4$ wherein R_4 is hydrogen or lower alkyl, —$CONR_6R_5$ wherein R_5 and R_6 are hydrogen or lower alkyl; and X is hydrogen or halogen and the pharmaceutically acceptable salts and N-oxides thereof.

4,125,727
METHOD OF PREPARING IMIDAZOISOINDOLEDIONES

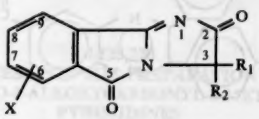
Marinus Los, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 733,635, Oct. 18, 1976, Pat. No. 4,062,671, which is a division of Ser. No. 631,357, Nov. 12, 1975, Pat. No. 4,017,510. This application Jul. 25, 1977, Ser. No. 818,799

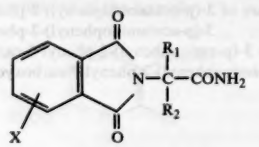
Int. Cl.[2] C07D *487/04*

U.S. Cl. 548—302 **5 Claims**

1. A method for the preparation of a compound having the formula:

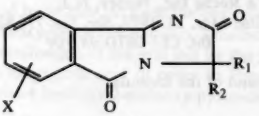


wherein X is H, CH_3, NO_2, Cl, OCH_3or SCH_3; R_1 is alkyl C_1–C_4 and R_2 is alkyl C_1–C_6, cycloalkyl C_3–C_6, alkenyl C_2–C_4, phenyl, halophenyl or benzyl; and when R_1 and R_2 are taken together they may form cycloalkyl C_3–C_6 optionally substituted with methyl, comprising; heating a compound having the structure:

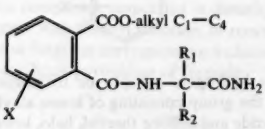


wherein X, R_1 and R_2 are as described to a temperature between about 80° C. and 150° C. in the presence of an inert organic solvent and a reagent of alkali metal hydrides or alkali metal hydroxides and removing any water formed during cyclization of the above-identified phthalimidocarboxamide from the reaction mixture and obtaining the above-identified imidazoisoindoledione.

4. A method for the preparatin of a compound having the formula:



wherein X is H, CH_3, NO_2, Cl, OCH_3or SCH_3; R_1 is alkyl C_1–C_4; and R_2 is alkyl C_1–C_6, cycloalkyl C_3–C_6, alkenyl C_2–C_4, phenyl, halophenyl or benzyl; and when R_1 and R_2 are taken together with the carbon to which they are attached, they may form cycloalkyl C_3–C_6 optionally substituted with methyl; comprising heating a compound having the formula:



wherein X, R_1 and R_2 are as defined, with an alkali metal hydride at a temperature between 80° C. and 150° C. in the presence of an inert organic solvent until the aboveidentified imidazoisoindoledione is formed.

4,125,728
METHOD FOR PREPARING 2,3,7,8-TETRAAZASPIRO[4,4]NONA-2,7-DIENE

Arnold T. Nielsen, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 743,723, Nov. 22, 1976, Pat. No. 4,066,833. This application Sep. 1, 1977, Ser. No. 829,761

Int. Cl.[2] C07D *487/10*

U.S. Cl. 548—356 **4 Claims**

1. A method for preparing 2,3,7,8-tetraazaspiro[4.4]nona-2,7diene comprising the steps of:

A. preparing 2,3,7,8-tetraazaspiro[4.4]nonane by reacting a reaction mixture formed from a solution of 4-phenylurazole in ethanolic potassium ethoxide and a solution of pentaerythrityl tetrabromide in dimethylformamide to form 2,2′-diphenyl-1,1′,3,3′-tetraoxo-6,6′-spirobi-[hexahydropyrazolo [1,2-a]-s-triazole], reacting the s-triazole with sodium hydroxide and hydrochloric acid in succession to form 2,3,7,8-tetraazaspiro-[4.4]nonane bishydrochloride, reacting the bishydrochloride with potassium bisulfate to form 2,3,7,8-tetraazaspiro[4.4]nonane sulfate, reacting the sulfate with ammonia to form said 2,3,7,8-tetraazaspiro[4.4]nonanel; and

B. reacting said nonane with mercuric oxide.

4,125,729
HYPOLIPEMIC α-ARYLOXY PARA SUBSTITUTED PHENYL ACETIC ACID COMPOUNDS

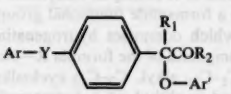
Ronald I. Trust, Highland Falls; Francis J. McEvoy, Pearl River, and Jay D. Albright, Nanuet, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 616,806, Sep. 25, 1975, abandoned. This application Feb. 17, 1977, Ser. No. 769,741

Int. Cl.[2] C07C *149/40, 147/107*; A61K *31/215*

U.S. Cl. 560—9 **12 Claims**

1. A compound of the formula:



wherein

Y is selected from the group consisting of sulfur, sulfinyl and sulfonyl;

R_1 is selected from the group consisting of hydrogen and lower alkyl of 1–6 carbon atoms;

R_2 is selected from the group consisting of hydroxy, lower alkoxy, lower alkoxyethoxy, 2,3-dihydroxy propoxy, and 3-loweralkoxy-2-hydroxy propoxy;

Ar is an aryl selected from the group consisting of phenyl, substituted phenyl wherein the substituents are cyano, halogen, hydroxy, trihalomethyl, nitro, amino, lower alkyl, lower alkoxy, loweralkylsulfonyl, loweralkylamino, diloweralkylamino, lower alkanoylamino;

Ar′ is an aryl selected from the group consisting of phenyl, naphthyl, 5,6,7,8-tetrahydro-1-naphthyl, 5,6,7,8-tetrahydro-2-naphthyl, 4-chloro-5,6,7,8-tetrahydro-1-naphthyl, 4-chloro-1-naphthyl, 4-indanyl, 5-indanyl, 1,1-diloweralkyl-6-indanyl, 1,1-diloweralkyl-5-indanyl, 5,5-diloweralkyl 5,6,7,8-tetrahydro-2-naphthyl, 8,8-diloweralkyl 5,6,7,8-tetrahydro-2-naphthyl, 7-halo-4-indanyl, substituted phenyl wherein the substituents are halogen, trihalomethyl, loweralkyl, cycloalkyl, lower alkoxy, cyano, phenyl, phenoxy, halophenoxy and benzyloxy; or, where R_2 is OH, an alkali metal or pharmaceutically acceptable organic base carboxylic salt thereof.

4,125,730

PREPARATION OF -AMINOALKANOIC ACID ARYLAMIDES

Hiroyoshi Hidaka, Corony-Kosha 1-24, 1044-1, Syona-cho, Kasugai-shi, Aichi-Ken; Ikuo Matsumoto; Yoshiaki Ito, both of Tokyo, and Nobuo Aoki, 263-59, Yamamoto-Cho, Utsunomiya-shi, Tochigi-Ken, all of Japan, assignors to Banyu Pharmaceutical Co., Ltd., Tokyo; Hiroyoshi Hidaka, Aichi and Nobuo Aoki, Tochigi, all of, Japan

Filed Oct. 10, 1975, Ser. No. 621,408

Claims priority, application Japan, Aug. 22, 1975, 50-101124

Int. Cl.[2] A61K *31/165, 31/245;* C07C *103/50, 69/78*

U.S. Cl. 560—37 3 Claims

1. A process for producing an ω-aminoalkanoic acid arylamide having the formula

$NH_2(CH_2)nCONHR$

wherein R represents phenyl or naphthyl which can be substituted by halogen, nitro, alkyl, alkoxy, hydroxyl, acetoamino or alkoxycarbonyl; and *n* is an integer of 4–8, which comprises: reacting an ω-aminoalkanoic acid of the formula $NH_2(CH_2)nCOOH$ with thionyl chloride in a solvent; and

then reacting the resultant ω-aminoalkanoyl chloride with an aromatic amine having the formula

RNH_2

without separating the acid chloride from the halogenating reaction medium, to produce the corresponding alkanoic acid arylamide.

4,125,731

NOVEL INDAN DERIVATIVES

Akihiko Sugie, Takarazuka; Hiromi Shimomura, Nishinomiya; Junki Katsube, Toyonaka, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

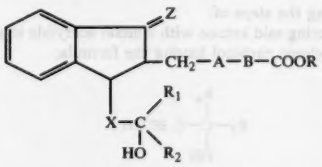
Filed Dec. 8, 1976, Ser. No. 748,539

Claims priority, application Japan, Dec. 23, 1975, 50-154485; Dec. 23, 1975, 50-154486; Jun. 4, 1976, 51-65982

Int. Cl.[2] C07C *69/76*

U.S. Cl. 560—53 6 Claims

1. A compound of the formula,



wherein A and X are each ethylene or vinylene; B is C_{2-4} alkylene; R and R_2 are each hydrogen or C_{1-4} alkyl; R_1 is C_{1-8} alkyl and $<C = Z$ is $<C = O$ or

4,125,732

2-ARYLOXY-2-(PHENOXYALKOXY)PHENYL ACETIC ACID AND ESTERS

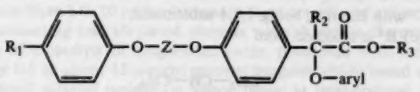
Francis J. McEvoy, Pearl River, and Jay D. Albright, Nanuet, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 6, 1977, Ser. No. 794,510

Int. Cl.[2] C07C *65/14, 69/76*

U.S. Cl. 560—62 13 Claims

1. A compound selected from the group consisting of those of the formula:

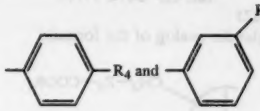


wherein R_1 is fluoro, chloro, trifluoromethyl or tert.-butyl; R_2 is hydrogen or straight chain alkyl having up to 6 carbon atoms; R_3 is hydrogen or alkyl having up to 4 carbon atoms; Z is a divalent radical selected from the group consisting of those of the formulae:

$$-CH_2-,\ -CH_2CH_2-,\ -CH_2CH_2CH_2-,$$

$$-CH(CH_3)-CH_2- \text{ and } -CH_2-CH(CH_3)-;$$

and aryl is selected from the group consisting of 3,4-dimethylphenyl, 3-methyl-4-chlorophenyl, 2-chloro-4-tert.-butylphenyl, 5-indanyl,5,6,7,8-tetrahydro-2-naphthyl and moieties of the formulae:



wherein R_4 is hydrogen, chloro, cyano, alkyl having up to 4 carbon atoms, trifluoromethyl, phenoxy, benzyloxy or cyclohexyl; and the pharmacologically acceptable cationic salts thereof when R_3 is hydrogen.

4,125,733

2,3-DIBROMOPROPYL POLYOXYETHYLENE TRIMELLITATE

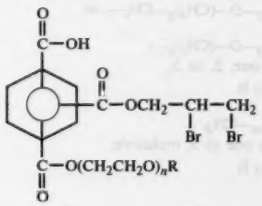
Stanley R. Sandler, Springfield, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Sep. 26, 1977, Ser. No. 836,287

Int. Cl.[2] C07C *69/76*

U.S. Cl. 560—87 6 Claims

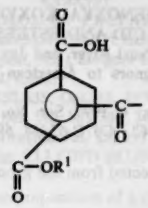
1. A compound having the formula



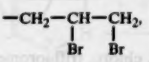
wherein

(a) the ring is 1,2,4 substituted;

(b) R is selected from H, $—CH_3$ or



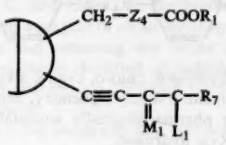
with the ring being 1,2,4 substituted;
(c) R^1 is selected from



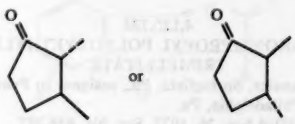
$(-CH_2CH_2O)_nH$ or $(-CH_2CH_2O)_n CH_3$; and
(d) n is 6–23.

4,125,734
5-OXA-13,14-DIDEHYDRO-11-DEOXY-PGE$_1$ COMPOUNDS
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Division of Ser. No. 657,740, Feb. 13, 1976. This application Aug. 1, 1977, Ser. No. 820,970
Int. Cl.^{2} C07C *17/00*
U.S. Cl. 560—121 **67 Claims**

1. A prostaglandin analog of the formula



wherein D is



wherein Z_4 is

$-CH_2-O-CH_2-(CH_2)_g-CH_2-$,

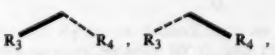
$-(CH_2)_2-O-(CH_2)_g-CH_2-$, or

$-(CH_2)_3-O-(CH_2)_g-$;

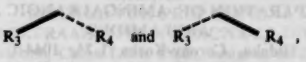
wherein g is one, 2, or 3;
wherein R_7 is

$-(CH_2)_m-CH_3$,

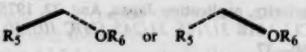
wherein m is one to 5, inclusive;
wherein L_1 is



or a mixture of



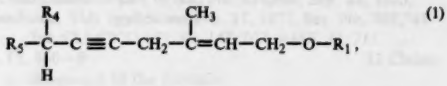
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen; and
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,125,735
SYNTHESIS OF ESTERS OF ACETYLENIC ALCOHOLS
Ralph E. Close, W. Jacksonville, Fla., and William Oroshnik, Plainfield, N.J., assignors to SCM Corporation, New York, N.Y.
Division of Ser. No. 560,550, Mar. 20, 1975, Pat. No. 4,055,575. This application Oct. 16, 1975, Ser. No. 622,851
Int. Cl.^{2} C07C *29/00, 67/28*
U.S. Cl. 560—254 **10 Claims**

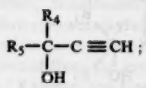
1. A process for the synthesis of a compound having the general formula:



(1)

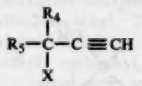
wherein R_1 is hydrogen or COR_2, R_2 being lower alkyl, phenyl, or aralkyl, R_4 is methyl and R_5 is alkyl; phenyl; aralkyl; 4,8-dimethyl-1,7-nonadienyl; 4,8-dimethyl-3,7-nonadienyl; 4,8-dimethyl-1,3-nonadienyl; 4,8-dimethyl-1-nonenyl; 4,8-dimethyl-3-nonenyl; 4,8-dimethyl-7-nonenyl; or 4,8-dimethyl-1,3,7-nonatrienyl; from a ketone having the configuration:

comprising the steps of:
(a) reacting said ketone with a metal acetylide to produce an acetylenic carbinol having the formula:



(2)

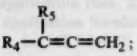
(b) reacting said acetylenic carbinol with a halogen acid to produce a propargylic halide having the formula:



(3)

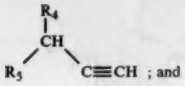
X being a halogen;

(c) reductively dehalogenating the propargylic halide to form the corresponding allene having the formula:



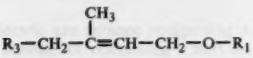
(4)

(d) isomerizing the allene in the presence of a strong base to an acetylene having the formula:



(5)

(e) coupling the acetylene of formula (5) in a coupling reaction with a compound having the general formula:



(6)

in which R_1 and R_2 are as stated and R_3 is a halogen, said coupling being carried out by reacting the acetylene of step (d) successively with a Grignard reagent in the presence of an aprotic solvent and then a cuprous salt, in that order, to form the cuprous salt of the acetylene, and then reacting the cuprous salt of the acetylene of step (d) with the compound of formula (6), also in the presence of an aprotic solvent.

4,125,736

METHOD FOR THE DISPROPORTIONATION OF HIGHLY ALKYLATED PHENOLS WITH PHENOL

Bruce E. Leach, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 762,083, Jan. 24, 1977. This application Nov. 17, 1977, Ser. No. 852,389

Int. Cl.[2] C07C *37/16*

U.S. Cl. 568—804 **6 Claims**

1. In a process for the disproportionation of xylenols, trialkyl phenols, tetra-alkyl phenols, and pentaalkyl phenols and mixtures of these with phenol, wherein the alkyl groups of each contain from 1 to 10 carbon atoms, to form cresols and xylenols by contacting said alkylated phenols with phenol in the presence of a catalyst of magnesium oxide, promoted with from about 0.5 to about 15 weight percent tungsten oxide based on the total catalyst weight, in vapor phase at temperatures of from about 350° to about 550° C and pressures of up to about 1,000 pounds per square inch gauge (psig), the improvement comprising synergistically increasing catalytic activity with sodium silicate and silica sol while adding from about 1 to about 15 weight percent water to the feestream based on the total weight of the feed, and carrying out the reaction at a liquid hourly space velocity (LHSV) of from 0.5 to about 5 in a continuous flow reactor.

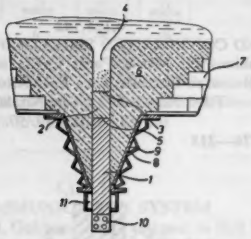
6. In a process for the methylation of phenol by contacting phenol with methanol in the presence of a catalyst comprising magnesium oxide promoted with from about 0.5 to about 15 weight percent tungsten oxide based on total catalyst weight in vapor phase at temperatures of from about 400° to about 500° C, the improvement comprising synergistically increasing catalyst activity with from about 1 to about 5 weight percent each of sodium silicate and silica sol and carrying out the reaction in a continuous flow reactor at an LHSV of from 0.5 to about 10.0.

4,125,737

ELECTRIC ARC FURNACE HEARTH CONNECTION

Conny Andersson, Viken, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Continuation-in-part of Ser. No. 634,061, Nov. 21, 1975, abandoned. This application Nov. 23, 1976, Ser. No. 744,423
Claims priority, application Sweden, Nov. 25, 1974, 7414743
Int. Cl.[2] H05B 7/00
U.S. Cl. 13—9 R 7 Claims



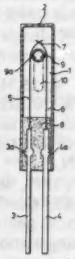
1. An electric arc furnace comprising a hearth having an inside and outside for containing a melt on its inside, an electrode positioned to form an arc between the electrode and a melt in the hearth when the electrode and melt have connections with an electric power source, an electric melt connection comprising at least one elongated metal conductor having inner and outer ends and a refractory enclosure exposing the inner end for contact with and melting by a melt in said hearth, and cooling means for cooling the conductor at least between its inner and outer ends for removing heat therefrom at a rate preventing the conductor from melting throughout its length to its outer end, said hearth comprising a refractory lining and said refractory enclosure comprising a downward hearth projection of said lining, said projection being an integral part of said lining and extending straight downwardly from the hearth's inside to beyond its outside and to the outer end of said conductor, and a metal shell projection enclosing said hearth projection on the outside of said hearth, said cooling means comprising means for removing heat from at least a portion of said shell on the outside of the hearth.

4,125,738

THERMOCOUPLE ELEMENT

Michael J. Nichols, Birtley, England, assignor to Thermal Syndicate Limited, Wallsend, England

Filed Jul. 21, 1977, Ser. No. 817,664
Int. Cl.[2] H01L 35/02
U.S. Cl. 136—234 13 Claims



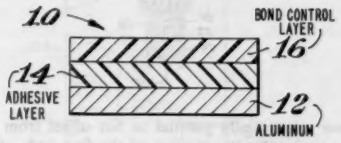
1. A hot junction element for a high temperature thermocouple, comprising a hollow envelope of vitreous silica; and a pair of dissimilar thermocouple wires forming a thermocouple junction within the envelope and each connected to a different contact member extending from one end of the envelope, the thermocouple wires being disposed loosely within the envelope and separated between the junction and the contact members by barrier means formed by pinching together localized areas of the wall of the envelope to define a recess into which molten metal can flow to approach the thermocouple junction.

4,125,739

CABLE SHIELDING TAPE AND CABLE

Kenneth E. Bow, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 2, 1976, Ser. No. 746,976
Int. Cl.[2] H01B 11/06
U.S. Cl. 174—36 6 Claims



1. A corrosion resistant cable shielding tape adapted for use in an electrical power or communications cable, said cable comprising a core of at least one insulated conductor, a shield surrounding the core and an outer plastic jacket surrounding and bonded to the shield, said shield comprising:

(1) metal strip having adhered to at least one side thereof a first adhesive layer composed of a copolymer of ethylene and from about 2 to about 20 percent based on copolymer weight of an ethylenically unsaturated carboxylic acid, the adhesive bond between said metal strip and said first adhesive layer being at least 2 pounds per inch of shielding tape width and sufficient to withstand delamination under conditions of normal use; and

(2) a bond control layer composed of a polymeric resinous material strippably adhered to said first adhesive layer, the adhesive bond between said first adhesive layer and said bond control layer being from about 2to about 20 pounds per one inch of shielding tape width and sufficient to withstand delamination under conditions of normal use but being less than the adhesive bond between said first adhesive layer and said metal strip, whereby, when the jacket is stripped from the cable, said bond control layer separates from said first adhesive layer prior to declamination of said first adhesive layer from said metal strip, leaving said first adhesive layer tightly adhered to said metal strip to provide corrosion protection thereto.

4,125,740

RESIN-ENCASED MICROELECTRONIC MODULE

Raimondo Paletto, Milan, Italy, assignor to SGS-ATES Componenti Elettronici S.p.A., Milan, Italy

Continuation of Ser. No. 671,374, Mar. 29, 1976, Pat. No. 4,059,810, which is a continuation-in-part of Ser. No. 508,951, Sep. 23, 1974, Pat. No. 4,032,706. This application Jun. 20, 1977, Ser. No. 808,371
Claims priority, application Italy, Sep. 26, 1973, 29390 A/73
The portion of the term of this patent subsequent to Jun. 28, 1994, has been disclaimed.
Int. Cl.[2] H05K 5/00
U.S. Cl. 174—52 PE 7 Claims

1. A microelectronic module comprising:

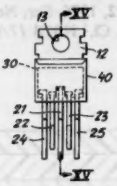
a sheet-metal plate with an upper and a lower face;

a semiconductive chip supported on the upper face of said plate;

a set of conductive tongues including a central tongue conductively and mechanically secured to said plate, a pair of intermediate tongues flanking said central tongue, and a pair of outer tongues flanking said intermediate tongues,

said intermediate and outer tongues being connected to respective terminals of said chip; and

a resinous body encasing said chip and three sides of said plate while leaving the lower face thereof exposed, said tongues being partly imbedded in said body and having portions projecting generally parallel to one another from a side of said body, the projecting portions of said central and outer tongues lying in a first plane, the projecting portions of said intermediate tongues lying in a second



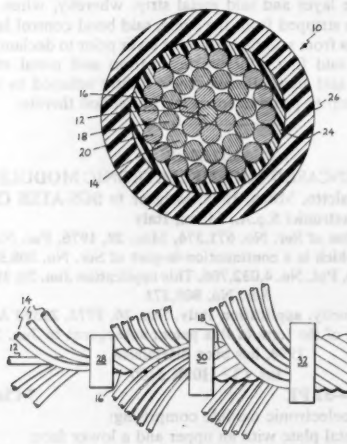
plane substantially parallel to but offset from said first plane whereby the spacing of the free ends of adjacent tongues is greater than that of the imbedded parts thereof; said plate having an edge confronting said tongues and forming an upwardly open median recess, said central tongue having a downwardly bent encased extremity received in said recess, said intermediate tongues having T-shaped encased ends offset from said encased extremity, said outer tongues having outwardly pointing L-shaped encased ends offset from said T-shaped ends.

4,125,741

DIFFERENTIALLY COMPRESSED, MULTI-LAYERED, CONCENTRIC CROSS LAY STRANDED CABLE ELECTRICAL CONDUCTOR, AND METHOD OF FORMING SAME

Ralph E. Wahl, Trumbull, and Alfred C. Bruhin, Huntington, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Sep. 30, 1977, Ser. No. 838,202
Int. Cl.[2] H01B *7/00*
U.S. Cl. 174—120 SC **24 Claims**



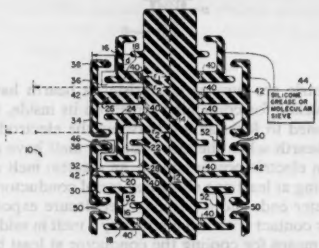
1. A compressed, multi-layered, concentric lay stranded cable with each succeeding overlying layer of strands helically wound in an alternately opposite direction to any adjoining layers of strands and circumferentially compressed without discernible strand deformation to an overall outside diameter reduction of not more than about three percent of its uncompressed diameter, said multi-layered, concentric lay stranded cable having each succeeding overlying, oppositely helically wound layer of strands circumferentially differentially compressed without discernible strand deformation to a regressively reduced degree of compression, whereby the strands of the layers helically wound in alternately opposite directions are substantially free of any indentations at intersections with strands of adjoining layers.

4,125,742

TIERED CONVOLUTED SHIELDED INSULATORS

Mario Rabinowitz, Menlo Park, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jun. 2, 1977, Ser. No. 802,603
Int. Cl.[2] H01B *17/50*
U.S. Cl. 174—211 **8 Claims**



1. An insulator for overhead electrical transmission lines comprising:

a longitudinally extended right circular cylindrical core of insulative material having a first radius;

a plurality of radially protruding members circumscribing said core;

a plurality of cylindrical shields longitudinally extended about said core;

at least two of said members mounted to said core and protruding radially from said core intermediate of said core and of a radially exterior environment;

at least one of said shields mounted to each of said two members, each said shield longitudinally overlapping selected portions of said members such that said members and said shields define a plurality of longitudinal voids and a plurality of annular channels having a convoluted path between said radially exterior environment and said core and wherein the width of each channel is scaled relative to the length of said corresponding path for minimizing free path migration of contaminants from said exterior environment to said core in order to maximize electrical resistance of said insulator.

4,125,743

GRAPHICS TRANSMISSION SYSTEM

Leonard E. O'Boyle, Oceanport, and Gabor P. Torok, Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

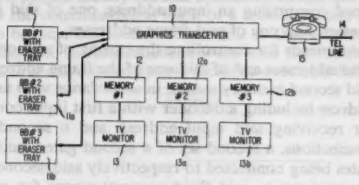
Filed Jun. 7, 1977, Ser. No. 804,341
Int. Cl.[2] G08C *21/00*
U.S. Cl. 178—18 **28 Claims**

1. A graphics originating station for transmitting graphics information to one or more remote stations, said originating station comprising:

one or more graphics input terminals each including a contact-sensitive writing surface means for converting writing or the like to electrical X–Y indicia of coordinate points;

means for transmitting said electrical indicia to said remote stations; and

means for delaying the sending of any electrical indicia derived from contact with any one of said writing surfaces



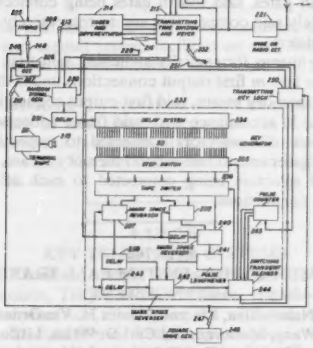
to said remote stations until said contact is at least a predetermined length in time.

4,125,744

COMMUNICATION SYSTEM

William M. Goodall, Oakhurst, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 24, 1948, Ser. No. 67,209
Int. Cl.[2] H04K *1/02*
U.S. Cl. 179—1.5 R **38 Claims**



1. In a pulse code modulation system, a source of key signals comprising a source of random pulses, multisection delay device, means for applying said pulses to said multisection delay device, apparatus for combining the outputs of predetermined sections of said delay device and apparatus for enciphering pulse code modulation signals by combining said signals with said combined output from said sections of said multisection delay device.

11. A pulse code modulation system comprising a source of voice frequency currents, apparatus for representing said voice frequency currents by means of code groups of signals occurring in rapid succession, a source of key signals, means for enciphering said code signals by means of said key signals, storage means having cipher changing information stored therein, apparatus for controlling generation of said key signals in accordance with information stored in said storage means.

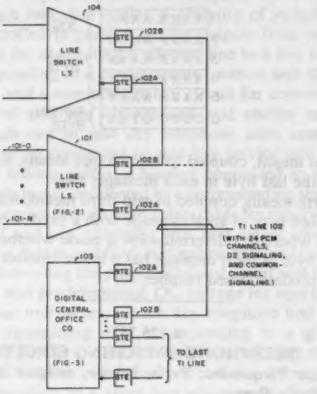
32. In a communication system for the transmission of complex signaling waves, apparatus for representing changes in amplitude of the signaling wave between predetermined instants of time by means of code groups of pulses, a source of cipher key signals and apparatus for combining said ciphered key signals with said pulses and means for recovering said differences in amplitude and reconstructing a complex wave form therefrom.

4,125,745

METHOD AND APPARATUS FOR SIGNALING AND FRAMING IN A TIME DIVISION MULTIPLEX COMMUNICATION SYSTEM

Robert E. Steidl, Columbus, Ohio, assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jun. 13, 1977, Ser. No. 805,814
Int. Cl.[2] H04J *3/06*
U.S. Cl. 179—15 BY **11 Claims**


LINE SWITCH LS
LINE SWITCH LS (FIG. 2-1)
DIGITAL CENTRAL OFFICE CO (FIG. 3-1)
STE
T1 LINE 100 (WITH 24 PCM CHANNELS, D.C. SIGNALING, AND COMMON-CHANNEL SIGNALING)
TO LAST T1 LINE

1. In a frame-organized time division multiplex system wherein each frame comprises a plurality of multibit information channels and at least one additional bit, and wherein predetermined frames are used to substitute signaling information in at least one predetermined bit position of each multibit information channel,

a method for utilizing said at least one additional bit for providing combined frame synchronization and reframing, frame identification of said predetermined frames, and common channel signaling, said method comprising the steps of:

(a) generating in said at least one additional bit position of the even-numbered frames a repetitive bit pattern suitable for identifying said predetermined frames,

(b) generating a frame synchronization status signal by monitoring successive received signal states in said at least one additional bit position of said even-numbered frames,

(c) reframing by monitoring for the presence of said repetitive bit pattern whenever said status signal indicates absence of frame synchronization, and

(d) performing common channel signaling in said at least one additional bit position of the odd-numbered frames whenever said status signal indicates presence of frame synchronization.

4,125,746

PARTIAL BYTE TRANSMIT APPARATUS FOR DIGITAL COMMUNICATION SYSTEMS

David L. Downey, Peoria; James A. Kennedy, and Liston E. Neely, both of Phoenix, all of Ariz., assignors to Honeywell Information Systems Inc., Waltham, Mass.

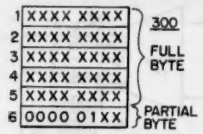
Filed May 18, 1977, Ser. No. 798,195
Int. Cl.[2] H04J *3/16*
U.S. Cl. 179—15 BA **5 Claims**

1. In a digital communication system comprising at least a main memory, and further comprising receiving means for synchronously receiving messages of information comprised of groups of bytes of information said bytes of information comprised of a predetermined number of bits of information, said messages of information being delineated by a predetermined pattern of bits at the beginning and end of each of said mes-

sages of information, said digital communication system also comprising transmitting means for synchronously transmitting the bytes of information, said digital communication system comprising:

a. first means for counting said bytes of information transmitted;

b. second means, coupled to said first means, for counting the number of each bits in each byte;



c. third means, coupled to said second means, for determining the last byte in each message; and,

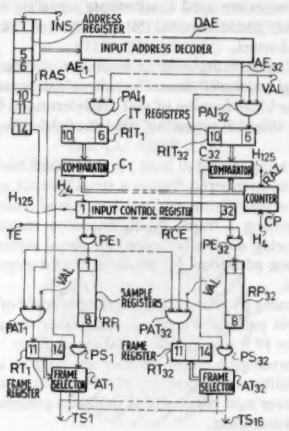
d. fourth means, coupled to said third means, for comparing the last byte of each message with a predetermined number, whereby a determination is made whether or not the last byte of each message has a lesser amount of bits than the predetermined number.

4,125,747

TELEPHONE SWITCHING CIRCUIT

Jean-Edgar Picquendar, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 27, 1976, Ser. No. 736,203
Claims priority, application France, Oct. 28, 1975, 75 32929
Int. Cl.[2] H04Q *11/04*
U.S. Cl. 179—15 AT **1 Claim**



1. A telephone circuit for switching *n* samples distributed according to a first natural sequence in an incoming PCM frame into *n* time intervals distributed amongst *m* output PCM frames, said circuit comprising:

first memory means for storing said samples into *n* storage positions in an order determined by said first natural sequence including an input control register with *n* states, the first one of said stages having a first clock input connection for receiving a binary digit, said states having a common second clock input connection for receiving a displacement clock signal, a first set of *n* first gates, said first gates being connected to a second input connection for receiving said samples and respectively to said states, and a set of *n* sample registers connected to said first *n* gates.

a second memory means for storing *n* time addresses determining a second natural sequence and *n* frame addresses, each of said time addresses and each of said frame addresses being related to one of said storage positions;

third memory means for temporarily storing an instruction word comprising an input address, one of said time addresses, and one of said frame addresses;

control means for controlling the storing of said one of the time addresses and of said one of the frame addresses into said second memory means, in accordance with said input address including a decoder with a first input connection for receiving said input address, and *n* second output connections, a second set of *n* second gates, said second gates being connected to respectively said second output connections, to said third memory means for receiving said time address, to an external connection for receiving a validation signal, and to said second memory means, a third set of *n* third gates, said third gates being connected to respectively said second output connections, to said third memory means for receiving said frame address, to said external connection, and to said second memory means;

reading means for reading said first memory means under the control of said second memory means in an order determined by said second natural sequence, delivering time switched samples including a counter connected to said second clock input connection for counting said displacement clock signal and to said first clock input for being reset by said binary digit, said counter marking a succession of *n* states; a set of *n* comparators connected to said counter and to said second memory means to comparing said states with said time addresses; and a fourth set of *n* fourth gates, said fourth gates being connected to respectively said comparators and to respectively said sample registers.

switching means for spatially switching said time switched samples into *m* first output connections under the control of said memory means, said first output connections being selected in accordance with said frame addresses including a set of *n* selectors connected to respectively said fourth gates and to said second memory means, and each of said selectors being connected to each of said first output connections.

4,125,748

COMMUNICATION SYSTEM CALL TRANSFER ARRANGEMENT

Charles E. Nahabedian, Lincroft; James H. VanOrnum, Hazlet; Tse-Lin Wang, Matawan, and Carl D. Weiss, Little Silver, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 31, 1977, Ser. No. 847,215
Int. Cl.[2] H04M *3/58*
U.S. Cl. 179—18 BD **8 Claims**

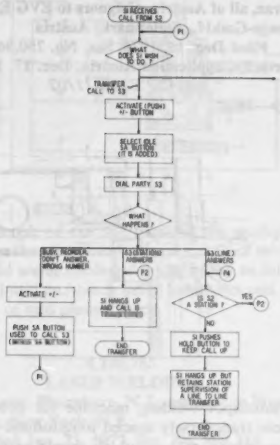
1. A call transfer arrangement for use in a communication system having a plurality of stations each having capability of communicating with other stations over communication links internal to the system, each of said stations having a plurality of nonlocking buttons operable to establish features or communication connections to said station, said call transfer arrangement comprising a switching network having a plurality of links and a single communication pair of leads extended to each station from said switching network, said connections being under control of momentary operations of said buttons,

means, including the arranging of at least two of said buttons at certain of said stations as system access buttons, each said system access button operable to enable connections to system facilities over said single pair of leads,

means responsive to the operation of either of said buttons for connecting the communication leads from said station to an available one of said network links,

means including the designation of one of said buttons at certain of said stations as a conference control button, said conference control button operable when said communication leads are connected to an available link for connect-

ing a second system facility to said available link in response to a subsequent operation of the other one of said system access buttons, so that the communication leads of a first system facility become connected to said link and so that the communication leads of a second system facility also become connected to said link so that a three party conference is established between said first station and said first and second system facilities over said link,



means for enabling said conference to continue between said first and second system facilities on said link when said first station becomes disassociated from said conference, and

means, including the operation at said disassociated station of either of said system access buttons, for enabling a connection to an available link even while said conference between said first and said second system facilities remain enabled.

4,125,749
KEY TELEPHONE SYSTEMS

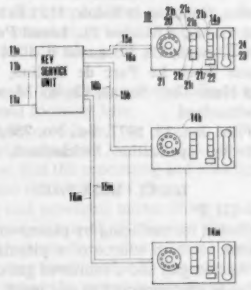
Toshiharu Kinoshita, Atsugi; Yoshio Shinoda, Yokohama; Takashi Oyamada, Tokyo; Mitsuo Masuda, Higashi-Kanamachi, and Noritomo Arai, Yokohama, all of Japan, assignors to Tamura Electric Works, Ltd., Tokyo, Japan

Filed Aug. 5, 1976, Ser. No. 711,975

Claims priority, application Japan, Aug. 9, 1975, 50-97027; Dec. 30, 1975, 51-158337; Dec. 30, 1975, 51-158338; Dec. 30, 1975, 51-179357[U]

Int. Cl.² H04M *1/00*

U.S. Cl. 179—99 **8 Claims**



1. In a key telephone system of the type comprising a key service unit and a plurality of non-grouped key telephone units adapted to be connected with said key service unit, each key telephone unit being provided with a plurality of line selection key buttons, the improvement which comprises pairs of a single talking cable and a single data cable extending between said key service unit and respective key telephone units, wherein said key service unit comprises a plurality of line circuits respectively supervising the states of respective lines, a plurality of station units for performing in parallel the supervision of said line circuits and for supplying pulse modulated data signals and an operating power to respective key telephone units through said data cables, a plurality of switching networks controlled in parallel by the outputs from respective station units for connecting a selected line to a key telephone unit corresponding to a predetermined station unit through a line circuit, and a common control circuit for controlling the operations of said line circuits and said station units; and wherein each one of said key telephone units comprises a telephone circuit connected to said key service unit through one of said talking cables, a handset connected to said telephone circuit, means connected to a corresponding station unit of said key service unit through a data cable for supervising the condition of said key telephone unit, said means transmitting and receiving data to and from said station unit, and converting means for converting the pulse modulated signal sent from said station unit into predetermined DC voltage for operating said key telephone unit, wherein each key telephone unit includes means for transmitting data corresponding to a given line selection key button to a station unit from said key telephone unit and said station unit includes means for comparing said data corresponding to a given line selection key button with data transmitted from the associated line circuit to determine whether the line is in a busy state or an idle state and for connecting the line with said key telephone unit when said line is idle.

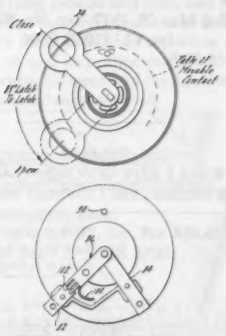
4,125,750
HIGH VOLTAGE ELECTRICAL SWITCH

John P. Cochran, Lexington, Ky., assignor to Kuhlman Corporation, Troy, Mich.

Filed Sep. 22, 1976, Ser. No. 725,574

Int. Cl.² H01H *33/04, 9/30*

U.S. Cl. 200—144 R **58 Claims**



1. A device for interrupting high voltage electrical currents capable of generating arc plasma when points of transmission are separated including:

a stationary energized element;

a movable energized element adapted to make electrical contact with said stationary element in a first position; and

motive means for interrupting the electrical connection between said elements in said first position by rapidly rotating said movable element about an axis in a circular path from said stationary element over a circumferential distance substantially greater than 180° within a predetermined time period, so that the arc plasma generated by the

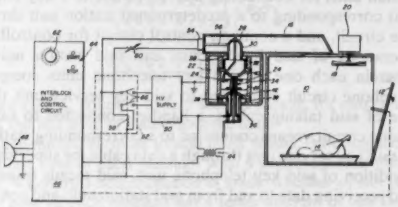
separation of said elements substantially traces the circular path of said movable element until said arc plasma is extinguished.

4,125,751

MICROWAVE OVEN CONTROL CIRCUIT

Clayton D. Brown, Cochituate, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Dec. 30, 1976, Ser. No. 755,697
Int. Cl.² H05B *9/00, 37/02, 39/04*
U.S. Cl. 219—10.55 B **9 Claims**



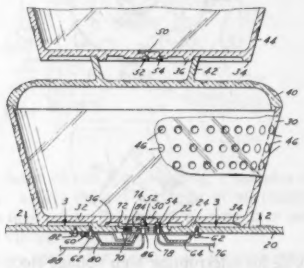
1. A microwave oven comprising:
a cavity;
a structure for coupling microwave energy to said cavity from a microwave generator having an electron source and an anode;
means for supplying a voltage between said electron source and said anode;
means for sensing radiation from said electron source at frequencies substantially above the frequency of said microwave energy; and
means responsive to said sensing means for controlling the supply of said voltage between said electron source and said anode of said microwave generator.

4,125,752

COOKING VESSEL TEMPERATURE CONTROL FOR MICROWAVE OVENS

Carl J. Wegener, 28106 Hoover Rd., Apt. #4, Warren, Mich. 48093

Filed May 25, 1977, Ser. No. 800,182
Int. Cl.² H05B *9/06*
U.S. Cl. 219—10.55 E **8 Claims**



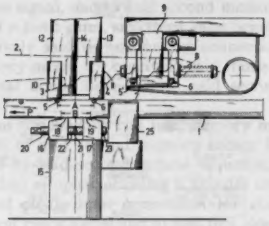
1. A control for microwave cooking which comprises:
(a) a vessel,
(b) a temperature responsive means carried by the wall of said vessel,
(c) a plurality of spaced contacts on the wall of said vessel connected to said temperature responsive means,
(d) a microwave oven and spaced contact means in a microwave oven control circuit, and
(e) means mounting said spaced contact means adjacent an oven wall to register with said contacts on said vessel to incorporate said temperature responsive means into a control circuit when said vessel is positioned in said microwave oven.

4,125,753

WELDING MACHINE FOR LATTICE GRATINGS

Klaus Ritter, Graz; Gerhard Jahrbacher, Peggau, and Gerhard Ritter, Graz, all of Austria, assignors to EVG Entwicklungs-u. Verwertungs-GmbH., Steiermark, Austria

Filed Dec. 15, 1976, Ser. No. 750,866
Claims priority, application Austria, Dec. 17, 1975, 9592/75
Int. Cl.² B23K *11/02*
U.S. Cl. 219—56 **5 Claims**



1. In a multispot welding machine for producing lattice gratings from transversely spaced longitudinal bars and from transverse members, each of which extend across the longitudinal bars and contacts a respective one of the longutudinal bars at a respective crossing location, the machine being of the type including a support on which the longitudinal bars rest and at least two welding electrodes, each of which contacts and presses against one of the transverse members at a different one of the crossing locations of the respective longitudinal bar during the welding operation of the machine, the improvement comprising means for imparting to the respective longitudinal bar during the welding operation a deformation which is substantially of the same magnitude as, and of the opposite sense than the deformation which the respective longitudinal bar suffers while cooling subsequent to the welding operation, including at least one abutment surface of the support which engages the respective longitudinal bar, intermediate the two different crossing locations, and about which the forces exerted by the welding electrodes on the respective transverse members deflect the respective longitudinal bar for the duration of the welding operation, while the respective longitudinal bar reassumes its original undistorted configuration upon cooling.

4,125,754

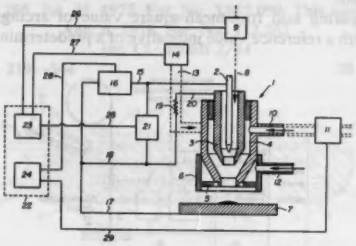
INSTALLATION FOR SURFACING USING PLASMA-ARC WELDING

René Wasserman, Domaine de Belair, 1111 Echichens, Switzerland; Joseph Quaas, 5 Marion Pl., Island Park, N.Y. 11558; Jean-Claude Chalard, Ch. Rosemont 9, 1024 Ecublens, Switzerland; Léon Noel, Le Parc de Gallion, 78220 Viroflay, France, and Hans-Théo Steine, Ch. du Mont Blanc 5, 1023 Crissier, Switzerland

Filed Jan. 13, 1977, Ser. No. 758,920
Claims priority, application Switzerland, Jan. 15, 1976, 444/76
Int. Cl.² B23K *9/00*
U.S. Cl. 219—121 P **13 Claims**

1. An installation for surfacing by plasma-arc welding comprising a plasma torch, a source of a plasma-forming gas, a source of protection gas, and a source of gas carrying powder surfacing material, all connected to said torch, a water cooling device for said torch and a control and power supply device for the formation of a transferred arc between the electrode of said torch and the workpiece to be surfaced, and of a non-

transferred arc between said electrode and the nozzle of said torch, characterized in that the control and supply device comprises a single d.c. source, one terminal of which is connected to the electrode of said torch and the other terminal of



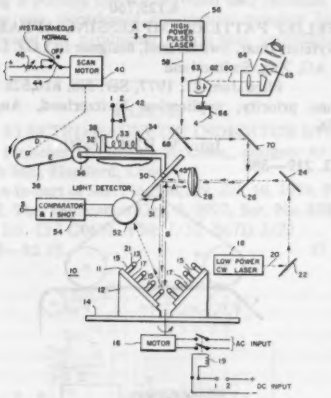
which is connected, on the one hand, to the workpiece to be surfaced and, on the other hand, to said nozzle of said torch via a resistance, said water cooling device having an inlet cooling water duct, and said resistance being located in said inlet cooling water duct of said plasma torch.

4,125,755

LASER WELDING

John M. Plamquist, Plainsboro, N.J., assignor to Western Electric Co., Inc., New York, N.Y.

Filed Jun. 23, 1977, Ser. No. 809,212
Int. Cl.[2] B23K *9/02*
U.S. Cl. 219—121 L **11 Claims**



1. A method of beam welding a plurality of workpieces disposed along a workpiece plane, comprising the steps of:

(a) aligning a processing beam from a processing beam source substantially along the principal axis of a focusing lens;

(b) aligning a scan light beam substantially along the principal axis of said focusing lens;

(c) disposing a moveable mirror between said lens and the workpiece plane and at a location along the principal axis of said lens so that the processing and scan light beams are reflected onto the workpiece plane;

(d) translating said moveable mirror along a path coincident with the principal axis of said lens so that the processing and scan light beams are reflected onto each workpiece, the mirror being positioned with respect to the workpiece plane such that as the mirror is translated a constant optical path is maintained between said lens and each workpiece; while

(e) positioning a light detection means to receive scan light reflected from each workpiece during the advancing of said moveable mirror over the plane for generating an electrical signal indicative of the detection of a workpiece; and

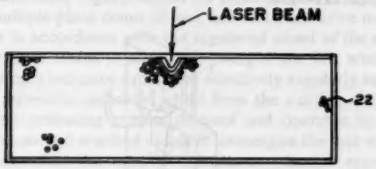
(f) triggering said beam source into emission to weld the detected workpiece in response to said electrical signal.

4,125,756

SILICON CARBIDE SHAPES AND METHOD OF PRODUCING THEM

Frank J. Hierholzer, Jr., Florissant; John A. Ancona, Affton, and Gerald L. Shelton, St. Louis, all of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 513,729, Oct. 10, 1974. This application Dec. 30, 1976, Ser. No. 755,465
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—121 LM **9 Claims**



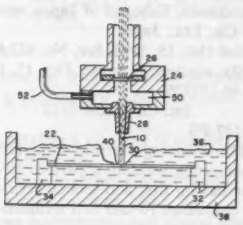
1. The method of forming a shape having a serpentine hot zone section comprising directing onto the surface of a bed of unconsolidated particles including silicon carbide a laser beam with energy sufficient to raise the temperature of silicon carbide particles in the area of impingement of the laser beam above 3000° F. and below 5500° F., moving the said bed and laser beam relative to one another at a rate to cause each increment of the silicon carbide particles exposed within the area of impingement to heat to between 3000° F. and 5500° F. and to be removed from the area of impingement both in a period of less than 20 seconds, causing a regrowth of silicon carbide to bond particles together to form a core and causing the formation of quartz to bond particles together and to said core to form a ring lying outside said core, said relative movement of laser beam and bed being directed to form said core in a serpentine pattern through at least a portion of said shape, successive reaches of said serpentine portion being spaced to cause said rind to bridge between said reaches during its formation, and thereafter removing said rind.

4,125,757

APPARATUS AND METHOD FOR LASER CUTTING

William A. Ross, New Hartford, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Nov. 4, 1977, Ser. No. 848,457
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—121 L **5 Claims**



1. Apparatus for cutting a workpiece with a laser beam

comprising: means for generating a laser beam; optical means for directing the laser beam towards a workpiece; a workpiece holder containing a liquid coolant in which the workpiece is immersed; and means for directing an exothermically reactive gas through the liquid coolant covering the workpiece under sufficient pressure and velocity to sweep away a sufficient amount of the liquid coolant from the workpiece to expose part of the workpiece to the laser beam.

4,125,758

VERTICAL WELDING METHOD

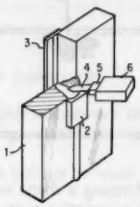
Minoru Oishi, Fujisawa; Keiichiro Hirakoso, Tokyo; Katsuro Iio, Fujisawa; Yasuhiro Nagai, Chigasaki, and Tetsurou Nariai, Kamakura, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Mar. 18, 1976, Ser. No. 667,954

Claims priority, application Japan, Mar. 18, 1975, 50-31862; May 1, 1975, 50-52068

Int. Cl.[2] B23K *9/00*

U.S. Cl. 219—126 **12 Claims**



1. A vertically upward arc welding method for base metal workpieces having a narrow welding groove space formed therebetween comprising the steps of:

feeding a strip electrode in a direction at which the plane including the width direction of said electrode crosses the weld line such that the angle formed between the welding advance direction and the longitudinal axis of said strip electrode is in the range of 20° to 90°,

generating an arc from said electrode to a base metal portion of the workpieces,

melting the upper base metal over a sliding backing shoe disposed on the front side surface of the welding groove space, and

performing said welding by expanding the welding groove space by forming an excavated portion of the base metal portion and dropping the molten metal onto a molten pool and depositing the same therein wherein the ratio of the width of the strip electrode to the welding groove space defined on the front side of the base metal workpieces is within the range of 1 : 0.2 to 1 : 5.

4,125,759

METHOD AND APPARATUS FOR SHORTCIRCUITING ARC WELDING

Michiya Kiyohara, Takatsuki; Toshiyuki Okada, Osaka, and Hideyuki Yamamoto, Kobe, all of Japan, assignors to Osaka Transformer Co., Ltd., Japan

Filed Oct. 15, 1975, Ser. No. 622,655

Claims priority, application Japan, Oct. 17, 1974, 49-119734; Oct. 17, 1974, 49-119735

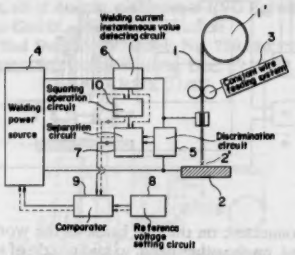
Int. Cl.[2] B23K *9/12*

U.S. Cl. 219—137 PS **6 Claims**

1. A method for effecting shortcircuiting arc welding by the use of a shortcircuiting welding apparatus having a source of welding power having first and second terminals, a consumable electrode connected to said first terminal of said welding power source, and a workpiece connected to said second terminal of said welding power source for alternately repeating current flow of arcing current and shortcircuiting current between said consumable electrode and the workpiece, said method comprising the steps of:

generating a root-mean-square value of said arcing current flowing between the consumable electrode and the workpiece

comparing said root-mean-square value of arcing current with a reference value indicative of a predetermined value



of said arcing current, and producing a control signal indicative of the difference between the measured root-mean-square value and the reference value; and

regulating the welding power source in response to said control signal for adjusting the welding power source such that the root-mean-square value of arcing current is maintained at a value substantially equal to the reference value.

4,125,760

RELIEF PATTERN IMPRESSING APPARATUS

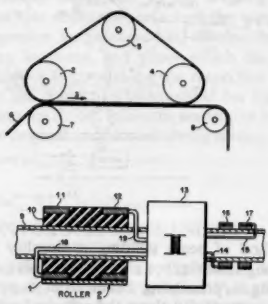
Alex Nyfeler, Baar, Switzerland, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Jun. 27, 1977, Ser. No. 810,528

Claims priority, application Switzerland, Aug. 3, 1976, 9889/76

Int. Cl.[2] B29C *17/00*

U.S. Cl. 219—388 **6 Claims**



1. An apparatus for impressing relief patterns of high resolution, such as phased holograms or phased diffraction gratings, in a thermoplastic information carrier, comprising:

an impressing matrix in strip form which carries the relief pattern to be impressed in said information carrier;

two calender rollers;

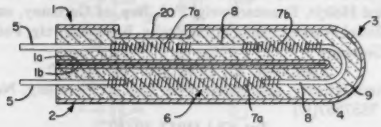
means for passing said impressing matrix in contact with said information carrier between said two calender rollers; and

means to pass an electric current through said impressing matrix in the direction transverse to the direction of movement of said strip to heat said impressing matrix to a temperature sufficient to impress said relief pattern in said information carrier.

4,125,761
BILATERAL HEATER UNIT

John W. Churchill, 12 Winthrop Ave., Beverly, Mass. 01915

Continuation-in-part of Ser. No. 513,140, Oct. 8, 1974, and Ser. No. 382,295, Jul. 25, 1973, Pat. No. 3,982,099. This application Aug. 6, 1976, Ser. No. 712,262
Int. Cl.[2] H05B 3/44
U.S. Cl. 219—544 25 Claims

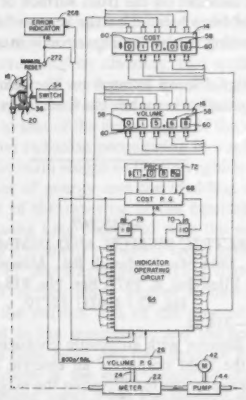


1. A bilateral heater unit comprising an elongated sheath in the form of two substantially parallel adjacent leg portions interconnected by a return bend portion formed of said elongated sheath bent back upon itself and being integral with the adjacent parallel extending leg portions, said leg portions being noncircular in cross-section and having arcuate outer portions circumscribing substantial portions of a circle, each of said leg portions having terminal means extending outwardly from the adjacent end portion thereof and spaced from said sheath, resistor assembly means secured between said terminal means of each of said leg portions and extending along the sheath between said terminal means, said sheath between said terminal means being filled with compacted powder insulation spacing said resistor assembly means from said sheath, said resistor assembly means including resistive heating means and at least one electrically conductive member extending within said sheath along a portion thereof between said terminal means, said at least one electrically conductive member having a length sufficient for producing a non-heat generating zone thereat.

4,125,762
ROTARY ELECTROMAGNETIC INDICATOR SYSTEM

Donald W. Fleischer, Wethersfield, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

Continuation-in-part of Ser. No. 706,129, Jul. 16, 1976, Pat. No. 4,071,742. This application Oct. 3, 1977, Ser. No. 838,763
Int. Cl.[2] G06M 1/28, 1/10; B67D 5/22
U.S. Cl. 235—92 FL 17 Claims

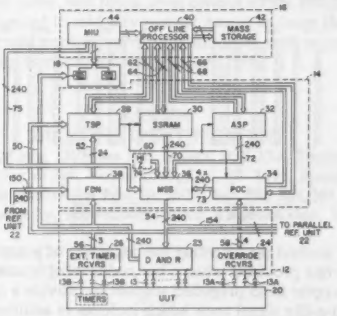


1. A fuel pump register for registering a multiple place count of fuel and comprising a bank of indicator decades having a bank of decimal indicator wheels of increasing place respectively for corresponding places respectively of said multiple place count of fuel; each indicator decade having electromagnetic wheel indexing means comprising a salient pole permanent magnet wheel rotor with an annular arrangement of ten equiangularly spaced alternating north and south salient magnetic poles, a salient pole electromagnetic stator cooperable therewith and having a stator core with an annular ring generally coaxial with the rotor and a plurality of angularly spaced salient stator poles adapted to be aligned with each salient pole of the permanent magnet rotor as the rotor is rotated through 360°, first winding means on the stator core adapted to be energized for angularly indexing the respective indicator wheel rotor and therefore the indicator wheel from each of ten decimal count rest indicating positions thereof to the succeeding decimal count rest indicating position, and second winding means on the stator core for sensing rotation of the permanent magnet wheel rotor; and register drive means for selectively energizing the first winding means of each indicator decade for a time interval controlled by the respective second winding means for indexing the bank of indicator wheels for indicating a multiple place count of fuel, the register drive means comprising electronic register means for electronically registering a said multiple place count of fuel, and electrical drive means operable in accordance with the registered count of the electronic register means to selectively energize the first winding means of each indicator decade for selectively angularly indexing the respective indicator wheel from the existing decimal count rest indicating position thereof and operable by the respective second winding means to deenergize the first winding means when the respective indicator wheel is approximately at its succeeding decimal count rest indicating position.

4,125,763
AUTOMATIC TESTER FOR MICROPROCESSOR BOARD

Richard B. Drabing, Santa Clara; Tim Y. Lam, and Charles Q. Hoard, both of Sunnyvale, all of Calif., assignors to Fluke Trendar Corporation, Mountain View, Calif.

Filed Jul. 15, 1977, Ser. No. 815,961
Int. Cl.[2] G06F 11/00; G01R 31/00
U.S. Cl. 235—302 19 Claims



1. An apparatus for testing a micro-processor based circuit board having a plurality of input terminals, said apparatus comprising:

means for generating a plurality of parallel preselected digital sequence patterns;

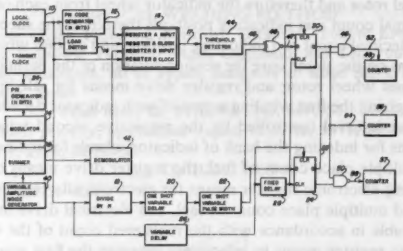
means for synthesizing a plurality of parallel pseudo-random digital sequential patterns; and

means for time multiplexing said digital sequential patterns of said generating means and of said synthesizing means to provide a selected merged sequence of said patterns to said plurality of input terminals.

4,125,764
TRANSVERSAL CORRELATOR ERROR DETECTOR

Ramon P. Chambers, Clearwater; Robert S. Gordy, Largo; David E. Sanders, and Cameron E. Morrison, both of St. Petersburg, all of Fla., assignors to E-Systems, Inc., Dallas, Tex.

Filed Aug. 1, 1977, Ser. No. 820,931
Int. Cl.[2] G06F *11/30*
U.S. Cl. 235—302 38 Claims



13. An apparatus for detecting error states generated by a correlator during the process of correlating a first signal that includes a predetermined code sequence with a second signal that includes said predetermined code sequence, comprising:

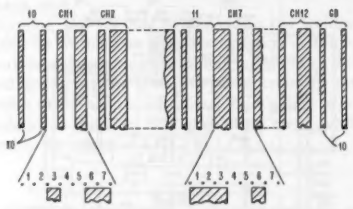
(a) first means for detecting a failure of said correlator to generate a correlation output pulse when said code sequence in said first signal is aligned in said correlator with said code sequence in said second signal, and

(b) second means for detecting generation of said correlation output pulse by said correlator when said code sequence in said first signal is not aligned in said correlator with said code sequence in said second signal.

4,125,765
LABEL FIND METHOD AND CIRCUIT

Robert L. Cowardin, Cary, and George J. Laurer, Raleigh, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 27, 1977, Ser. No. 809,964
Int. Cl.[2] G06K *7/10, 19/06*
U.S. Cl. 235—463 7 Claims



1. A method for detecting the beginning of potentially valid coded data provided when a bar coded label is scanned by an electro-optic hand propelled scanner to provide a coded electric pulse-like signal train which includes in addition to noise-like components an analog of the bar-coded label comprising the steps of:

establishing first and second overlapping repetitive time periods based on different corresponding characteristics of the said pulse-like signal train;

selecting at least two different counting rates based on the characteristics of the code;

counting at a different one of said rates during each of said established time periods;

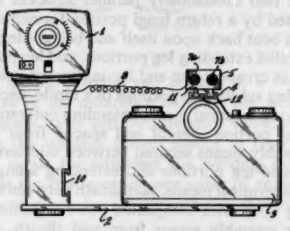
comparing on a continuing basis the counts at the end of the last of each of the time period pairs to determine if one of the accumulated counts equals or exceeds the other; and,

indicating the beginning of a coded signal train whenever the said one count equals or exceeds the said other count in a pair of counts.

4,125,766
AUTOMATIC ELECTRONIC FLASH DEVICE

Wilfried Höltje, Braunschweig, Fed. Rep. of Germany, assignor to Rollei Werke Franke & Heidecke, Braunschweig, Fed. Rep. of Germany

Filed Nov. 12, 1976, Ser. No. 741,250
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1975, 7537557[U]
Int. Cl.[2] H01J *39/12*
U.S. Cl. 250—214 SF 3 Claims



1. An automatic electronic flash device for use with a camera having a connector shoe, comprising:

a flash attachment energized by discharge of a capacitor through a flash lamp and having a connector foot for selective insertion into the connector shoe, further having a connector shoe adjacent to the connector foot;

a casing, including a front surface and a rear surface, and being connected to the flash attachment by an electrical cable;

a connector foot of a standard type on said casing for fastening said casing alternatively to the camera and to the flash attachment by insertion of the foot of the casing into one of said shoes;

a light-sensitive sensor mounted within the casing for sensing light incident on the front surface of said casing;

a first signal lamp located on the rear surface of said casing for indicating when the capacitor is in a charged condition; and

a second signal lamp located on the rear surface of said casing for indicating when the flash lamp has been flashed.

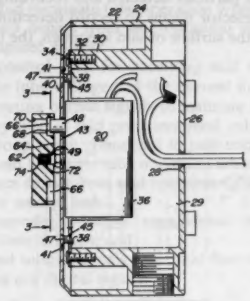
4,125,767
PHOTOELECTRIC SWITCH AND DIMMER CONTROL

Harry Silver, 1844 Meadowbrook Rd., Abington, Pa. 19001

Filed Jul. 8, 1977, Ser. No. 814,062
Int. Cl.[2] H01U *39/19*
U.S. Cl. 250—214 D 15 Claims

1. A lamp dimmer with automatic photoelectric control for establishing the light output of an electric lamp comprising current adjusting means for adjusting the magnitude of electric current provided to said lamp to adjust its light output, said current adjusting means being coupled to a manually movable member, the position of said member establishing the magnitude of current conduction, and photoelectric controlled switching means being enabled to sense the intensity of ambient light when said movable member is in a first predetermined position, said photoelectric controlled switching means operat-

ing in response to the intensity of light reaching it to allow current of a predetermined magnitude to flow to said lamp to



effect the illumination thereof when the intensity of the light reaching it is below a predetermined value.

4,125,768

APPARATUS FOR LAUNCHING OR DETECTING WAVES OF SELECTED MODES IN AN OPTICAL DIELECTRIC WAVEGUIDE

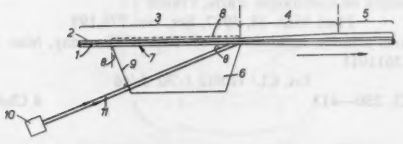
Lynden A. Jackson, and John E. Midwinter, both of Ipswich, England, assignors to Post Office, London, England

Continuation of Ser. No. 640,770, Dec. 15, 1975, abandoned. This application Nov. 3, 1977, Ser. No. 848,362

Claims priority, application United Kingdom, Dec. 18, 1974, 54764/74

Int. Cl.[2] G02B *5/14*; H01J *5/16, 39/12*

U.S. Cl. 250—227 **12 Claims**



1. Apparatus for launching or detecting radiation in selected modes of propagation in an optical dielectric fibre waveguide having a core surrounded by cladding, said apparatus including a tapered section of waveguide in which the transverse dimension of at least the core of the waveguide is progressively reduced relative to that of the main length of the waveguide to such an extent that radiation propagating in a selected tightly bound mode in the main length of the waveguide would lose a significant amount of energy into the cladding of the waveguide as a result of the tapering of the tapered section, the tapered section being long compared with the wavelength of the radiation, and a prism of refractive index greater than that of the cladding of the waveguide having first and second surfaces, the first surface being located alongside the waveguide, adjacent the narrow end of the tapered section and optically coupled to the waveguide, and the second surface being such that a light beam can pass through it towards the waveguide to induce in the main length of the waveguide radiation propagating away from the tapered section in the selected mode, and can pass through it away from the waveguide due to radiation propagating towards the tapered section in the selected mode in the main length of the waveguide, at least part of the tapered section lying between the point of incidence and emergence of the light beam on the waveguide and the broad end of the tapered section.

4,125,769

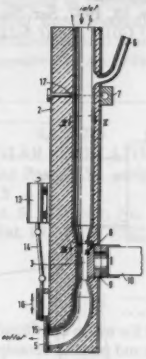
APPARATUS FOR QUANTITATIVE IN-LINE X-RAY FLUORESCENCE ANALYSIS OF SLURRIES

Rainer Marten, and Harald Schneider, both of Geesthacht, Fed. Rep. of Germany, assignors to Gesellschaft fur Kernenergieverwertung in Schiffbau und Schiffahrt mbH, Geesthacht-Tesperhude, Fed. Rep. of Germany

Filed May 18, 1977, Ser. No. 798,121

Int. Cl.[2] G01M *23/22*

U.S. Cl. 250—272 **8 Claims**



1. An apparatus for the quantitative in-line X-ray fluorescence analysis of slurries, which includes: a measuring tube having an inlet and an outlet for respectively receiving the slurries to be investigated and releasing investigated slurries, a measuring station arranged at an area of said measuring tube which area is located between said inlet and said outlet, said measuring station including a radioactive preparation for generating X-ray fluorescence radiation through the slurry at said measuring station and also including a detector for receiving and measuring said fluorescence radiation through said slurry at said measuring station, filling level control means arranged at said tube between said inlet and said measuring station for controlling the filling level of said tube, a control valve arranged at said outlet and operable to vary the free opening of said outlet, and servo-motor means operatively connected to said control valve, said filling level control means being operatively connected to said servo-motor means to cause the latter to actuate said control valve in conformity with a predetermined filling level of said slurry in said tube.

4,125,770

DIAMOND IDENTIFICATION

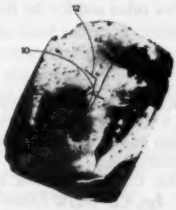
Andrew R. Lang, 1B Elton Rd., Bristol BS8 1SJ, England

Continuation of Ser. No. 645,347, Dec. 30, 1975, abandoned. This application Jun. 30, 1977, Ser. No. 811,764

Claims priority, application United Kingdom, Jan. 3, 1975, 328/75

Int. Cl.[2] G01N *21/00, 23/20*; G21K *1/00*

U.S. Cl. 250—272 **17 Claims**



1. A method of determining whether a diamond to be identified is the same as or different to a known diamond including

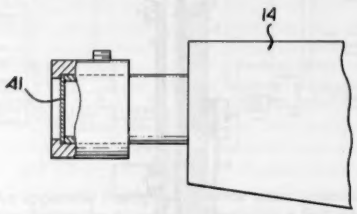
the steps of producing one or more records of internal defects of the diamond to be identified using X-ray topography and comparing the records so produced with similar records produced from the known diamond.

4,125,771

APPARATUS FOR DETERMINING STRESS IN NICKEL AND TITANIUM ALLOYED MATERIALS

Robert C. Erwin, Calabasas, Calif., assignor to NET Systems Inc., Woodland Hills, Calif.

Filed Nov. 18, 1977, Ser. No. 852,799
Int. Cl.[2] G01N *23/20*; G21K *1/00*
U.S. Cl. 250—277 R **5 Claims**



1. An improvement for use in combination with an apparatus for determining stress and percent retained austenite in a specimen containing both austenite and martensite crystalline structure by X-ray diffraction which includes:

a. a first X-ray source having a target of a particular material which irradiates with an X-ray beam a surface area of the specimen impinging on the surface area at a particular angle;

b. a second X-ray source having a target of a particular material which irradiates with an X-ray beam the same surface area of the specimen simultaneously impinging at another particular angle;

c. a first detecting tube for detecting diffracted X-rays from a particular crystallographic plane;

d. a second detector tube for detecting diffracted X-rays from another equivalent and particular crystallographic plane;

e. first and second circuit means which are independently response to the outputs of the first and second detector tubes for providing outputs proportional to the intensities of the diffracted X-rays;

f. positioning means for positioning the first and second detector tubes in response to the difference of the outputs of the first and second circuit means; and

g. detecting means for detecting the angular position of the first and second detector tubes, said improvement comprising:

a. a filter element of steel foil in the range of 0.0001 inches to 0.0021 inches; and

b. a second filter of iron oxide in the range of 0.001 inches to 0.010 inches in combination with said first filter element, said combination optically coupled in the path of each detector tube; and

c. means for maintaining a circle of focus for the first and second detector tubes and for the first and second x-ray tubes.

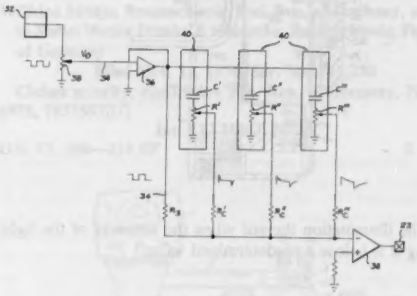
4,125,772

SCANNING ELECTRON MICROSCOPE WITH EDDY-CURRENT COMPENSATION

Duane C. Holmes, San Jose, Calif., assignor to American Optical Corporation, Southbridge, Mass.

Filed Oct. 13, 1977, Ser. No. 841,629
Int. Cl.[2] G21K *1/08*
U.S. Cl. 250—396 ML **2 Claims**

1. In a scanning charged particle microprobe system including a source of charged particles, means for collimating said particles into a beam, means for scanning said beam in a predetermined raster over a specimen in said microprobe system, detector means including means for generating a signal proportional to charged particles detected and recording means connected to said detector means to record detection of charged particles exiting the surface of said specimen, the improvement comprising:



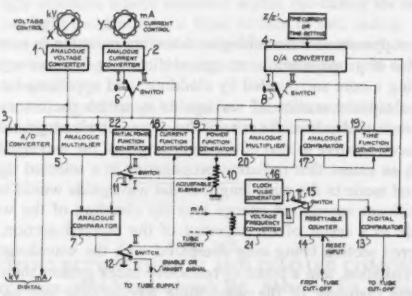
means for generating a step function electrical signal connected to said scanning means and applying said signal to said means for scanning said beam thereby to deflect said beam, means for generating an exponentially decaying electrical signal connected to said step function generating means whereby the sum of said step function and said exponential electrical signals eliminate eddy current losses generated by said step function signal when applied to said means for scanning said beam.

4,125,773

CONTROL SYSTEM FOR X-RAY APPARATUS

Hans Aldenhovel, Essen, Germany, assignor to Compagnie Generale de Radiologie, Paris, France

Filed Mar. 18, 1977, Ser. No. 779,199
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1976, 2611911
Int. Cl.[2] H05G *1/30, 1/46*
U.S. Cl. 250—413 **4 Claims**



1. In a control system for an X-ray apparatus which includes means for selecting the X-ray tube voltage, the time of exposure, the X-ray tube current and the current-time product, and further includes computer means for generating and storing optimum settings for the X-ray tube parameters based on predetermined values of X-ray tube performance, the improvement comprising:

converter means for changing the externally selected tube parameter values into electrical values related thereto;

a first control loop for receiving said electrical values related to tube voltage, tube current and the time of exposure, and

for generating output signals to maintain the operation of the X-ray tube at said predetermined values, said first control loop being connected to said computer means to correct and terminate tube operation when the actual tube parameters depart from said optimum settings stored in said computer means;

a second control loop for receiving said electrical values related to tube voltage and the current time product, and for generating output signals to maintain the operation of the X-ray tube at said predetermined values, said second control loop being connected to said computer means to correct and terminate tube operation when the actual tube parameters depart from said optimum values stored in said computer means; and

switch means for selective engagement of said first and second control loops; and

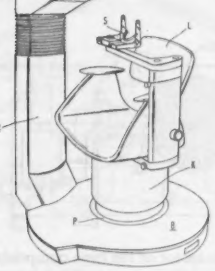
wherein said output signals from said first and second control loops are digital signals.

4,125,774

PANORAMIC DENTAL X-RAY MACHINE

Anthony Ciavattoni, Staten Island, N.Y.; Josef Ujvary, Kingston, and John M. Gardella, Matawan, both of N.J., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Dec. 1, 1977, Ser. No. 856,422
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—439 P **13 Claims**



13. In a panoramic dental X-ray machine for providing continuous radiographic images of the dental arch-temporomandibular joint area of a patient seated in a chair mounted on a mechansim affixed to a stationary platform of said X-ray machine, said X-ray machine having a column carrying,

(a) a tubehead containing an X-ray source, and

(b) film holder for holding film to be activated by said X-ray source,

said machine including means to power said X-ray source and means for moving said film in said film in said holder, and means for rotating said column about said patient in a circular pattern, the improvement therewith wherein said mechanism comprises means for transporting said chair in a semicircular pattern in one direction while said column continuously orbits the patient in an opposite direction to provide a continuous panoramic radiographic image of said dental arch-temporomandibular joint area of said patient, said mechanism comprising,

a Y-axis plate having a channel-shaped guideway affixed thereto disposed along a Y-axis,

an X-axis plate having a channel-shaped guideway affixed thereto disposed along an X-axis,

means external said Y-axis plate for rotating a crank assembly, said crank assembly comprising a pair of depending roller guides disposed in different planes, each of said roller guides describing an arc of revolution of different radii when rotated about an axis of rotation of said crank assembly,

one of said roller guides engaging said guideway disposed along a Y-axis and the other of said roller guides engaging said guideway disposed along an X-axis,

means affixed to said Y-axis plate and X-axis plate for permitting X direction motion to said Y-axis plate and Y direction motion to said X-axis plate, said X-axis plate being in superposed relationship to said Y-axis plate,

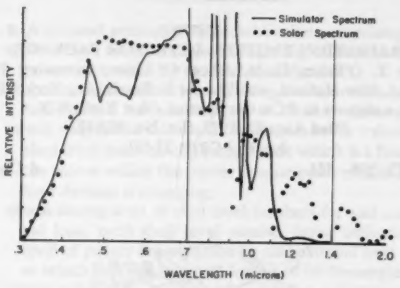
said roller guides engaged in respective guideways urging said plates to travel simultaneously in their respective directions upon rotation of said crank assembly whereby said chair is transported in accordance with a predetermined pattern.

4,125,775

SOLAR SIMULATOR

Jan B. Chodak, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Oct. 5, 1977, Ser. No. 839,496
Int. Cl.[2] F21V *9/02*
U.S. Cl. 250—504 **3 Claims**



1. A solar simulator comprising, in combination, a xenon arc light source and a glass ultraviolet absorption filter for filtering ultraviolet light from the xenon arc light source prior to use, wherein the glass filter is composed of a transparent base glass having an absorption coefficient at a wavelength of about 0.33 microns not exceeding about 25 cm^{-1}, to which base glass has been added tin oxide in at least an amount effective to reduce the irradiance of the simulator at wavelengths below 0.3 microns to less than 1% of the average irradiance of the simulator in the visible range.

4,125,776

COLLIMATOR FOR X AND GAMMA RADIATION

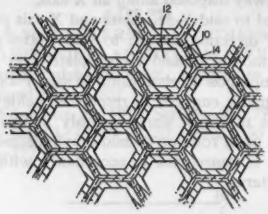
Christopher H. Tosswill, and Clinton J. Beuscher, both of Sturbridge, Mass., assignors to Galileo Electro-Optics Corp., Sturbridge, Mass.

Continuation-in-part of Ser. No. 558,899, Mar. 17, 1975, abandoned. This application Sep. 23, 1976, Ser. No. 725,835
Int. Cl.[2] H01J *35/16*
U.S. Cl. 250—508 **11 Claims**

1. A collimator for hard radiation comprising:

a glass mosaic substrate having a plurality of closely packed glass columns aligned in parallel, each of said columns having a passage longitudinally therethrough and being at least 5 times as long as its said passage is wide, the walls of each of said columns bounding said passage having a coating of metal having an absorption coefficient of at least 14 for the radiation to be collimated, and each of said columns having present therein a radiation absorbing chemical compound such that each of the glass columns has an absorption coefficient for the radiation to be collimated sufficient to give a product of that absorption coefficient multiplied by the length of each column in centime-

ters of at least 12, said metal coating and said chemical compound having absorption coefficients and being present in amounts sufficient to limit the fraction of radiation that passes through said collimator by penetrating through



said column walls together with the fraction of radiation that passes through said collimator by traveling entirely within said glass columns to not more than 1/100 of the fraction of radiation that passes through said collimator by passing entirely through passages.

4,125,777

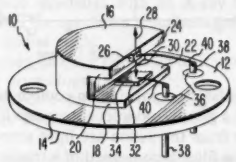
RADIATION EMITTER-DETECTOR PACKAGE

James T. O'Brien, Leola; Albert C. Limm, Lancaster; Paul Nyul, New Holland, and Vincent S. Tassia, Jr., York, all of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 17, 1977, Ser. No. 825,473

Int. Cl.[2] G02B *27/00*

U.S. Cl. 250—551 **6 Claims**



1. A radiation emitter-detector package comprising:

a metallic base member having opposed flat surfaces; and

means for mounting a semiconductor electroluminescent device of the type having a primary emission in one direction and a secondary radiation emission in a different direction, and a radiation detector having a radiation incident surface in the optical path of the secondary emission of said electroluminescent device, said means electrically contacting said electroluminescent device to said radiation detector, said means being on one surface of said metallic base member.

4,125,778

APPARATUS FOR LASER ANEMOMETRY

Anthony E. Smart, Spondon, England, assignor to Rolls-Royce Limited, London, England

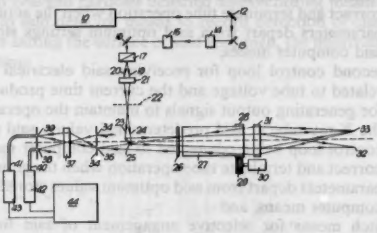
Filed Aug. 25, 1977, Ser. No. 827,746

Claims priority, application United Kingdom, Sep. 4, 1976, *36723/76*

Int. Cl.[2] G01N *21/00, 21/26*

U.S. Cl. 250—574 **11 Claims**

1. Apparatus for laser anemometry comprising a device for producing coherent radiation, a beam splitter adapted to divide the beam from this device into two beam portions, focussing means adapted to focus these two beam portions on to two adjacent spots, and two photo-detector means each adapted to measure the scattered radiation from one said spot and in which an image rotation device is interposed between the beam splitter and the spots so that it has a simultaneous effect both on the beams of radiation producing the spots and on the



scattered radiation from the spots which falls on the photo-detector means.

4,125,779

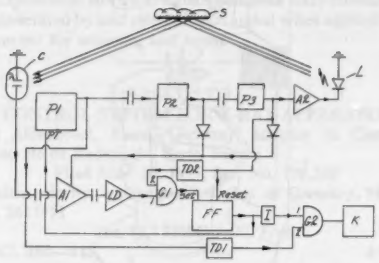
SMOKE DETECTOR

William J. Malinowski, Pembroke, Mass., assignor to Chloride, Incorporated, Tampa, Fla.

Filed Jul. 13, 1977, Ser. No. 815,103

Int. Cl.[2] G01N *21/26*

U.S. Cl. 340—630 **11 Claims**



1. In a smoke detector of the type comprising a light source, a photo-responsive device producing an output signal in response to light from the light source reflected from smoke particles, an amplifier for amplifying said output signal, and alarm actuating means responsive to an amplified output signal above a predetermined level to actuate an alarm, the improvement comprising normally closed gating means between the amplifier and the alarm actuating means, circuit means for, in sequence, energizing the amplifier, energizing the light source, and opening said gating means, and means for de-energizing the amplifier and the light source substantially simultaneously.

4,125,780

MULTIPLE FLUID EXPANSION ENERGY EXTRACTION METHOD AND APPARATUS

Clarence K. Greene, 100 N. Arlington Ave., Reno, Nev. 89501

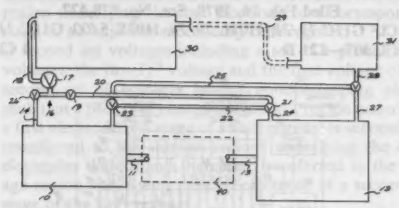
Filed May 27, 1975, Ser. No. 574,539

Int. Cl.[2] F01D *15/10*

U.S. Cl. 290—4 A **11 Claims**

1. The method for utilizing the latent energy of an expansible fluid comprising: (1) introducing an expansible fluid in its primary condition into a first expander; (2) removing the fluid from the said first expander after expansion therein; (3) introducing the fluid so removed from the first expander into a second expander; (4) removing the fluid from the said second

expander after further expansion therein; (5) coupling the output of each of said expanders together in a differential



manner; and (6) utilizing the combined output through the differential coupling for a single combined power output.

4,125,781

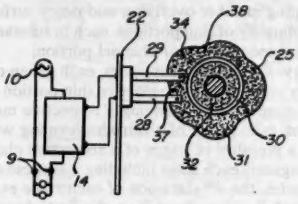
CHRISTMAS TREE LIGHTING CONTROL

George B. Davis, Jr., 7512 Marbury Rd., Bethesda, Md. 20034

Continuation-in-part of Ser. No. 637,025, Dec. 12, 1975, Pat. No. 4,057,735. This application Dec. 14, 1976, Ser. No. 750,404

Int. Cl.[2] H02J *3/00*

U.S. Cl. 307—11 20 Claims



1. An ornamental lighting control including in combination a plurality of solid state duty cycle units having a common input and respectively variable duty cycle outputs, connector means respectively connected to each duty cycle output for connecting thereto an ornamental lighting source with the duty cycle of said output determining the light output intensity of a lighting source connected therewith, an RC gating circuit forming a respective part of each duty cycle unit and wherein the resistance value of the gating circuit resistor determines the duty cycle of the unit and output thereof, a resistance disk forming the gating circuit resistor in each RC circuit and including a resistance surface having differing resistance values for predetermined fixed distances across its surface, contact means electrically engaging the resistance surface of said disk and respectively connecting the resistance surface of the disk in the gating circuit of each duty cycle unit, motor means opperable to effect relative movement between said contact means and said resistance surface to apply predetermined random like resistance changes from said disk respectively to the gating circuit of each duty cycle unit to vary gradually and in predetermined random and in respectively differing order the duty cycle of each duty cycle unit whereby the light output intensity pattern of each lighting source respectively connected to the output of each duty cycle unit shall differ one from the other for a predetermined operating interval of said motor means.

4,125,782

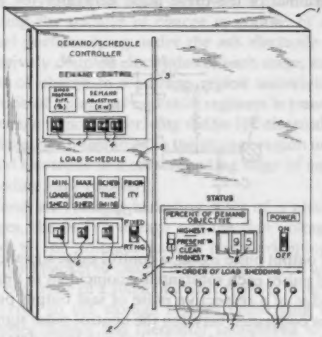
DEMAND/SCHEDULE CONTROLLER

Harold J. Pollnow, Jr., Dousman, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Feb. 15, 1977, Ser. No. 768,859

Int. Cl.[2] H02J *3/14*

U.S. Cl. 307—35 7 Claims



1. A demand controller the combination comprising:

input circuit means for generating a signal indicative of the power consumed by external load devices;

output circuit means for controlling the operation of one of said external loads in response to a received status signal;

means coupled to said input circuit means for calculating a shed level index having a magnitude which is a function of the rate at which the power consumption of said external load devices is changing;

means storing a set of shed level numbers for said one external load, each shed level number being indicative of a level of power consumption by said external load devices at which said one external load is to be deenergized;

means coupled to said shed level index calculating means and said shed level storage means for selecting one of said plurality of stored shed level numbers, said selection being determined by the magnitude of said calculated shed level index;

means coupled to said shed level selection means and said input circuit means for comparing the level of power consumption indicated by said selected shed level number with the level of power consumption of said external load devices; and

means coupled to said comparing means and said output circuit means for generating a status signal to said output circuit means indicating that said one external load is to be deenergized when the level of power consumption of said external load devices exceeds the level of power consumption indicated by said selected shed level number.

4,125,783

TOUCH SWITCHES

Philip C. Sefton, 51 Midhurst Rd., London W13 9XS, England

Filed Sep. 23, 1976, Ser. No. 726,055

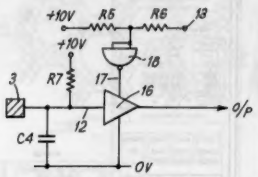
Claims priority, application United Kingdom, Sep. 23, 1975, 38950/75

Int. Cl.[2] H01H *35/00*

U.S. Cl. 307—116 9 Claims

1. A touch switch comprising: a first and at least one second capacitively coupled electrodes positioned relative to each other for altering the capacitive coupling therebetween by the presence or absence of part of a user's body; a drive pulse generator having an output terminal connected to a first of said electrodes and operable to produce an output pulse signal having a leading edge in the form of a steep ramp, followed by a relatively slow returning edge; a logic detector circuit having an output terminal and two input terminals, the first of said

input terminals being connected to receive the output from the second of said electrodes, the detector circuit being operable to trigger or fail to trigger in accordance with the amplitude of the signal applied to said first input terminal to thereby detect the presence or absence of a part of a user's body and to generate, at its output terminal, a control signal in accordance therewith to initiate a switching action; means connected to the output terminal of the drive pulse generator for generating,



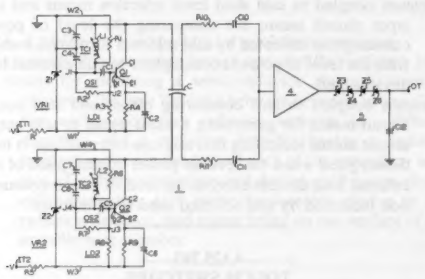
from said output pulse signal, a control pulse signal comprising a series of pulses each substantially coincident in time with the leading edge of a respective pulse of said output pulse signal; and means connected between the control pulse signal generator and the second input terminal of said logic detector circuit for applying the control pulse signal to said second logic input terminal for causing the detector circuit to act on the signal applied to said first input terminal only for the duration of each control pulse.

4,125,784

FAIL-SAFE OR GATE

John R. Harrison, Gibsonia, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Jul. 27, 1977, Ser. No. 819,514
Int. Cl.[2] H03K *19/02, 19/30*
U.S. Cl. 307—218 **10 Claims**



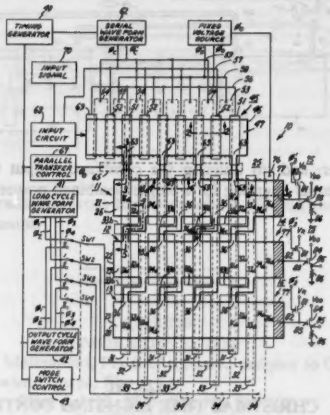
1. A vital logic circuit comprising at least a first and a second fail-safe level detecting means, each of said first and said second fail-safe level detecting means including a voltage breakdown device and an oscillating circuit, an impedance means loosely coupling the frequency determining circuit of each of said oscillating circuits, an amplifying means coupled to each of said oscillating circuits, and means connected to said amplifying circuit and having an output signal developed thereon either when a d.c. input signal exceeds the breakdown voltage of one of said breakdown devices of said first and second fail-safe level detecting means or when a d.c. input signal exceeds the breakdown voltages of both of said breakdown devices of said first and said second fail-safe level detecting means.

4,125,785

CHARGE TRANSFER MEMORY APPARATUS

Donald J. MacLennan, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 16, 1978, Ser. No. 878,427
Int. Cl.[2] G11C *19/28;* **H01L** *29/78;* **H03K** *5/00;* **G11C** *11/24*
U.S. Cl. 307—221 D **4 Claims**



1. Charge transfer memory apparatus comprising

a substrate of semiconductor material of one conductivity type including a plurality of major channel portions adjacent a major surface of said substrate, each successively aligned in a parallel array,

an insulating member overlying said major surface and having a plurality of thin portions, each in substantial registry with a respective major channel portion,

a plurality of groups of electrodes, each group of electrodes serially arranged on a respective thin portion of said insulating member and overlying a respective major channel portion, each group of electrodes forming with said substrate a plurality of stages of a respective charge transfer shift register, each stage including n successively coupled electrodes, the n^{th} electrode of each stage except the last of a shift register coupled to the first electrode of next succeeding stage of the shift register, where n is an integral number greater than three,

a plurality of minor channel portions adjacent said major surface of said substrate, each extending from a storage region underlying an $(n-1)^{th}$ electrode of one stage of a shift register to a storage region underlying the first electrode of corresponding stage of an adjacent successive shift register, each of said $(n-1)^{th}$ electrodes having a first portion overlying an entrant part of a respective minor channel portion and each of said first electrodes having a second portion overlying an exit part of a respective minor channel portion, the entrant and exit parts of each of said minor channel portions being contiguous, each of the first portions of said $(n-1)^{th}$ electrodes insulatingly overlying the second portion of a respective one of said first electrodes,

control means for alternately applying a first and second set of n voltages to the n successively coupled electrodes of each stage, respectively,

said first set of voltages including a set of $(n-1)$ phase-related voltages for effecting the successive transfer of charge in the storage regions underlying the first electrode to the storage region underlying the $(n-1)^{th}$ electrode of a stage and an n^{th} voltage having a value which provides a barrier inhibiting the transfer of charge in regions of said main channel portions lying under the n^{th} electrode of said n successively coupled electrodes of each stage such that a packet of charge in a storage region

underlying a first electrode of a stage of said shift registers is transferred to the storage region underlying the $(n-1)^{th}$ electrode thereof and thereafter transferred to the storage region underlying the first electrode in a corresponding stage of an adjacent succeeding shift register,

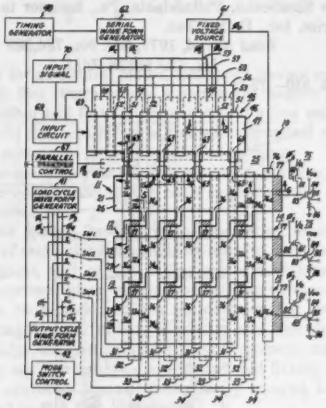
said second set voltages including a set of n phase-related voltages, the $(n-1)^{th}$ voltage and the first voltage of said second set of voltages having nonoverlapping phases, such that a packet of charge in a storage region underlying a first electrode of a stage of a shift register is successively transferred to the storage regions underlying the other electrodes thereof and thereafter transferred to the storage region underlying the first electrode of a succeeding stage of the shift register.

4,125,786

CHARGE TRANSFER MEMORY APPARATUS

Donald J. MacLennan, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 19, 1977, Ser. No. 825,924
Int. Cl.[2] G11C *19/28*; H01L *29/78*
U.S. Cl. 307—221 D **5 Claims**



1. A charge transfer memory apparatus comprising

a substrate of semiconductor material of one conductivity type including a plurality of major channel portions adjacent a major surface of said substrate, each successively aligned in a parallel array,

an insulating member overlying said major surface and having a plurality of thin portions, each in substantial registry with a respective major channel portion,

a plurality of groups of electrodes, each group of electrodes serially arranged on a respective thin portion of said insulating member and overlying a respective major channel portion, each group of electrodes forming with said substrate a plurality of stages of a respective charge transfer shift register, each stage including n successively coupled electrodes, the n^{th} electrode of each stage except the last of a shift register coupled to the first electrode of next succeeding stage of the shift register, where n is an integral number greater than three,

a plurality of minor channel portions adjacent said major surface of said substrate, each extending from a storage region underlying an $(n\text{-}1)^{th}$ electrode of one stage of a shift register to a storage region underlying the first electrode of a corresponding stage of an adjacent successive shift register, each of said $(n\text{-}1)^{th}$ electrodes having a first portion overlying an entrant part of a respective minor channel portion and each of said first electrodes having a second portion overlying an exit part of a respective minor channel portion,

control means for alternately applying a first and second set of n voltages to the n successively coupled electrodes of each stage, respectively,

said first set of voltages including a set of $(n\text{-}1)$ phase-related voltages for effecting the successive transfer of charge in the storage regions underlying the first electrode to the storage region underlying the $(n\text{-}1)^{th}$ electrode of a stage and an n^{th} voltage having a value which provides a barrier inhibiting the transfer of charge in regions of said main channel portions lying under the nth electrode of said n successively coupled electrodes of each stage, such that a packet of charge in a storage region underlying a first electrode of a stage of said shift registers is transferred to the storage region underlying the $(n\text{-}1)^{th}$ electrode thereof and thereafter transferred to the storage region underlying the first electrode in a corresponding stage of an adjacent succeeding shift register,

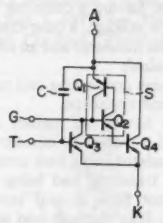
said second set voltages including a set of n phase-related voltages, the $(n\text{-}1)^{th}$ voltage and the first voltage of said second set of voltages having nonoverlapping phases, such that a packet of charge in a storage region underlying a first electrode of a stage of a shift register is successively transferred to the storage regions underlying the other electrodes thereof and thereafter transferred to the storage region underlying the first electrode of a succeeding stage of the shift register.

4,125,787

SEMICONDUCTOR SWITCH CIRCUIT

Ichiro Ohhinata, Yokohama; Shinzi Okuhara, Fujisawa; Mitsuru Kawanami, Yokohama, and Michio Tokunaga, Zushi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 26, 1977, Ser. No. 790,938
Claims priority, application Japan, Apr. 28, 1976, 51-47704
Int. Cl.[2] H03K *17/72, 17/60*
U.S. Cl. 307—252 A **8 Claims**



1. A semiconductor switch circuit comprising a PNPN switch having a gate terminal and at least three PN-junctions equivalently including first and second transistors;

a load current dividing circuit including at least a transistor;

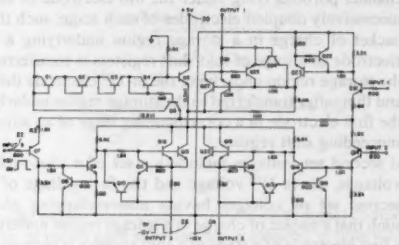
a variable impedance bypass circuit including at least a transistor; and

a capacitive element, the base and the collector of said transistor included in said load current dividing circuit being connected respectively to a cathode and an anode of said PNPN switch, the collector and the emitter of said transistor included in said variable impedance bypass circuit being connected respectively to a P-type base of said second transistor of said PNPN switch and the emitter of said transistor included in said load current dividing circuit, and the base of said transistor included in said variable impedance bypass circuit being connected to selected one of the anode of said PNPN switch and an N-type base of said first transistor through said capacitive element, whereby gate turn-off operation of said switch circuit is performed by controlling the base of said transistor included in said variable impedance bypass circuit.

4,125,788
VOLTAGE LEVEL SHIFTING DEVICE

Warren G. Kohman, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 31, 1977, Ser. No. 801,664
Int. Cl.[2] H03K 1/14, 5/00
U.S. Cl. 307—264 5 Claims



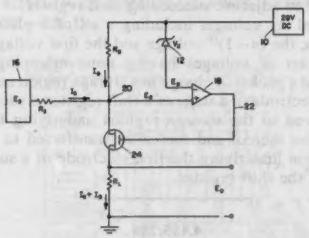
1. A level shifting network for shifting positive voltage logic levels to negative voltage logic levels comprising:
(a) an input and an output;
(b) transistor circuit means coupled in circuit with said input and output and being responsive to a positive voltage logic low at said input for providing a negative voltage logic low at said output and being responsive to a positive voltage logic high at said input for providing a negative voltage logic high at said output;
(c) said transistor circuit means including:
a power terminal adapted to be connected to a negative voltage source;
a first reference voltage source;
a first transistor having an emitter connected to said first reference voltage, a base coupled to said input and a collector;
a second reference voltage source;
a second transistor having a collector connected to said second reference voltage, a base connected to the collector of said first transistor and an emitter connected to said power terminal;
a low impedance sink connecting said output to the collector of said second transistor;
a third transistor having an emitter connected to said power terminal, a collector connected to the base of said second transistor and a base coupled to the emitter of said second transistor and being responsive to the transistor current flow in said second transistor for limiting current flow through said second transistor.

4,125,789
BIASING AND SCALING CIRCUIT FOR TRANSDUCERS

Michael M. Van Schoiack, Bellevue, Wash., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 7, 1977, Ser. No. 804,419
Int. Cl.[2] H03K 17/00
U.S. Cl. 307—296 R 5 Claims

1. A bias and scaling circuit for use with a source of signals from a transducer or the like comprising:
a voltage source;
an operational amplifier having a first and a second input terminal and an output terminal;
a diode connected between said voltage source and said first operational amplifier input terminal;
a current summing junction connected to said second operational amplifier input;
a bias resistor connected between said voltage source and said current summing junction;
a scaling resistor connected between the signal source and said current summing junction;
a field effect transistor having a gate terminal connected to said operational amplifier output terminal and an input terminal connected to said current summing junction; and

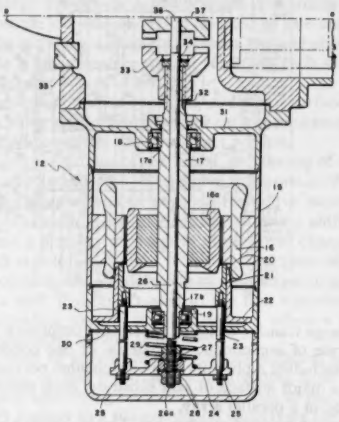


a load resistor connected to an output terminal of said field effect transistor.

4,125,790
MAGNETIC MECHANICAL DISCONNECT

Andrew Stratienko, Philadelphia, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 4, 1977, Ser. No. 784,389
Int. Cl.[2] H02K 7/12
U.S. Cl. 310—75 D 5 Claims



1. In a valve actuator assembly having a housing assembly, a driven stem, an electric motor which creates an internal magnetic field, a driven gear on the stem, a driving gear engaging the driven gear, and a manual valve operator; the improvement comprising:
said motor having an output shaft with an output clutch member slidably mounted and resiliently biased outward thereon;
said driving gear being slidably located on a hollow shaft coaxially aligned with said motor output shaft;
said manual operator having a shaft slidably mounted in said housing assembly, coaxially aligned with said hollow shaft, and having a clutch member on the end thereof; clutch members on each end of said hollow shaft;
a rod assembly slidably located in said hollow shaft, adapted for abutment with said motor output shaft and said manual operator shaft, and of a sufficient length to prevent simultaneous engagement of said output clutch member and said manual operator clutch member with said hollow shaft clutch members; and
means responsive to said internal magnetic field and opera-

bly connected to said rod assembly for longitudinally displacing said rod assembly in order to engage and disengage said clutches for motor powered operation and alternate manual operation of said valve actuator.

4,125,791

STATOR FOR AN ELECTRICAL MACHINE

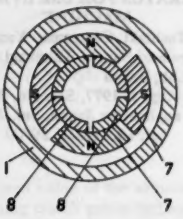
Bodo Futterer, Lucerne, Switzerland, assignor to Interelectric AG, Sachseln, Switzerland

Filed Nov. 5, 1976, Ser. No. 739,264

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1975, 2550640

Int. Cl.[2] H02K *21/26*

U.S. Cl. 310—154 2 Claims



1. A stator for an electric motor, said stator having an outer ferromagnetic flux return means, a permanent magnet system positioned within said flux return means, and a first end plate supporting said flux return means and said permanent magnet system, said permanent magnet system comprising:

at least four spaced permanent magnets, each of said magnets having a cylindrically shaped outer surface portion and an inner surface; and

at least four spaced ferromagnetic flux linking means, the number of said linking means being equal to the number of said magnets, each of said linking means having an outer surface corresponding in shape to said inner surface of said magnets, each of said linking means extending between, and having its outer surface secured to said inner surfaces of two adjacent ones of said spaced permanent magnets, whereby said permanent magnets and said linking means may be correctly spaced before being secured to each other and to said first end plates.

4,125,792

BRUSHLESS D-C MOTOR

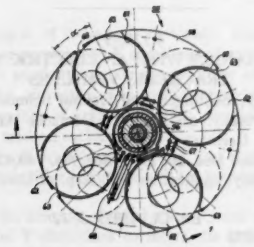
Fritz Schmider, Hornberg, Fed. Rep. of Germany, assignor to Papst Motoren KG, St. Georgen, Fed. Rep. of Germany

Filed May 12, 1975, Ser. No. 576,650

Claims priority, application Fed. Rep. of Germany, May 18, 1974, 2424290

Int. Cl.[2] H02K *3/04, 29/02*

U.S. Cl. 310—268 52 Claims



1. A slow speed brushless speed controlled d-c motor having a coreless stator winding and a rotary multipolar permanent magnet rotor which in operation interacts with a rotary field produced by the coreless stator winding, and a sensor arrangement controlled by the rotary position of the rotor connected to control current flow through the stator winding;

wherein the stator winding has a maximum of two magnetically active coil sections per pole of the multipolar rotor two coil sections forming a set;

the coil sections are located in two superposed layers;

and a number of coil sections (62) corresponding to the number of pairs of poles are interconnected and symmetrically distributed in one layer and the same number of coil sections (63) are symmetrically distributed in the second layer of the two layer winding, the coil sections of the second layer being displaced by an angle (α) relative to the coils of the first layer;

wherein the displacement angle (α) is an odd multiple of 90°-el and the maximum width of the coils is about 360°-el;

means deriving a control signal representative of speed of rotation of the rotor;

and means controlling current flow through said stator coil sections in dependence on said control signal.

47. Brushless d-c motor having a coreless permanent magnet rotor;

and a stator coil arrangement having two sets of coil sections (a, b) forming a single layer winding to generate a rotary field on the rotor,

wherein the coil sections of any set being symmetrically placed along the circumference of the rotor, one set being offset with respect to the other by $(2k + 1) \times 90°$-el., wherein $k = 0, 1, 2, 3, 4 \ldots n$;

at least two coil sections form a set and these coil sections are serially connected and unidirectionally wound with respect to each other, and spaced along the circumference by whole multiples of 360°-el.

4,125,793

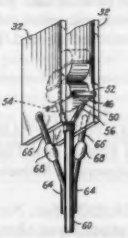
PHOTOMULTIPLIER WITH DYNODE SUPPORT STRUCTURE

Hans Timan, Yonkers, N.Y., assignor to DuMont Electron Tubes & Devices Corporation, Clifton, N.J.

Filed Feb. 1, 1977, Ser. No. 764,649

Int. Cl.[2] H01J *39/02, 43/18*

U.S. Cl. 313—95 4 Claims



1. A photomultiplier tube comprising a photocathode, a plurality of dynodes rigidly supported in fixed spatial relation to one another on a first support member, an anode being located adjacent to a last one of said dynodes, said anode being supported by a second support member which is separate from first support member, said first support member is a pair of dielectric side supports between and to which said dynodes are rigidly mounted, electrical contacts and leads to said dynodes extend outside said pair of side supports, said first support member is rigidly attached to the inside of a glass envelope which houses said tube, said second support member is a wire which is attached to a different portion of said tube, said wire is electrically conducting and is rigidly attached to a pin in a stem of the envelope and a pair of members extending between said first and second support members, said pair of members

being electrically insulating and mechanically rigid, and for preventing microphonics between said anode and last dynode.

4,125,794

ELECTRONIC TOUCH KEY

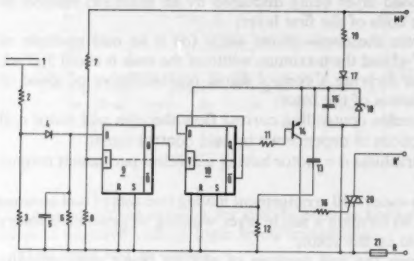
Joachim Pohl, Lüdenscheid, Germany, assignor to Brown, Boveri & Cie AG, Mannheim-Käfertal, Germany

Filed Jun. 20, 1977, Ser. No. 808,316

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1976, 2627663

Int. Cl.[2] H05B *37/02, 39/06, 41/04, 41/18*

U.S. Cl. 315—362 **1 Claim**



1. Electronic touch key assembly with a metal probe having touch or keying surfaces through which, when the surfaces are contacted, a capacitive reactive current flows, triggering a switching amplifier through which an electronic valve for controlling brightness of a lamp is opened, comprising a high resistance serially connected to the touch or keying surfaces, said surfaces being formed of metal and being insulated from one another, a filter and a rectifier connected to said high resistance, said high resistance serving through said filter and said rectifier as a voltage source, a first and a second bistable multivibrator, said voltage source having an output connected to the second bistable multivibrator, said first bistable multivibrator being connected to said second bistable multivibrator and serving as a switching amplifier which, at a defined voltage threshold of the line voltage, sets said second bistable multivibrator into an opposite output state, a PNP transistor having a base, said second bistable multivibrator having an output connected to said base of said PNP transistor for addressing the latter, the electronic valve comprising a Triac, and said transistor being connected to said Triac for driving the same.

4,125,795

CONVERGENCE APPARATUS

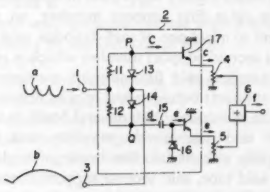
Shigeki Ikebata; Junichi Fujino, and Hideto Miyazaki, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1977, Ser. No. 799,994

Claims priority, application Japan, Jun. 1, 1976, 51-64875

Int. Cl.[2] H01J *29/70, 29/76*

U.S. Cl. 315—368 **4 Claims**



1. A convergence apparatus in a cathode-ray tube for displaying images by a raster scanning of electron beams which comprises means responsive to the amplitude of a vertical parabolic waveform voltage for dividing a horizontal parabolic waveform voltage into suitable voltage levels

means for shaping the waveforms of the divided voltage signals;

means for composing the shaped voltage signals to give the shaped convergence correction voltage signal; and

means for feeding the current corresponding to the shaped convergence correction voltage signal waveform to a convergence coil to correct the scanning positions of the electron beams.

4,125,796

CONTROL APPARATUS FOR USE IN A SYNCHRONOUS MACHINE

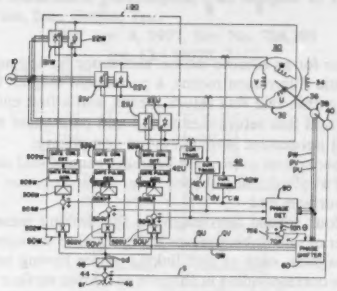
Hiroshi Nagase; Toshiaki Okuyama; Yuzuru Kubota, all of Hitachi, and Katsunori Suzuki, Takahagi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 1, 1977, Ser. No. 820,649

Claims priority, application Japan, Jul. 30, 1976, 51/90283

Int. Cl.[2] H02K *29/00*

U.S. Cl. 318—175 **5 Claims**



1. A control apparatus for a synchronous machine with a field and an armature windings, one of the windings being provided on a stator of the machine and the other winding on a rotor thereof, comprising a converter having a plurality of thyristors for controlling an electric power fed to the armature winding, means for producing a signal corresponding to the position of the rotor, means for generating an armature current pattern signal on the basis of both the output signal of the producing means and the difference between a speed reference and an actual rotating speed of the rotor, and means for controlling the thyristors in accordance with the deviation between an actual armature current and the armature current pattern signal, characterized by means for detecting a phase difference between the actual armature current and the output signal of the producing means and means for shifting the output signal of the producing means in accordance with the output of said detecting means.

4,125,797

DRIVE MECHANISM WITH AN ELECTRIC MOTOR FOR TRACKLESS VEHICLES

Christian Bader, Boblingen, and Helmut Schmidt, Rettigheim, both of Germany, assignors to Deutsche Automobilgesellschaft mbH, Germany

Filed Dec. 10, 1976, Ser. No. 749,428

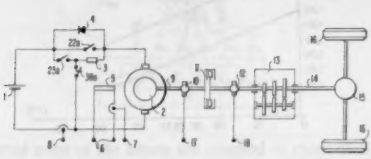
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1975, 2555668

Int. Cl.[2] H02P *3/12*

U.S. Cl. 318—270 **20 Claims**

1. In a drive arrangement with the use of an electric motor having an armature and a field winding for trackless vehicles, in which the rotational speed adjustment takes place by vary-

ing the field energization of the motor and which includes a separating clutch means connected behind the motor as well as a change-speed transmission means having at least two speeds in the forward driving direction, a first field energizing current control means controlling the energization of the field winding, a second current control means producing the desired value of the field energizing current operatively connected with its output to the input of the first current control means, the second current control means having two inputs to which are applied, on the one hand, the actual-value of the armature current and, on the other, a desired value for the armature current, and means including selectively operable means for



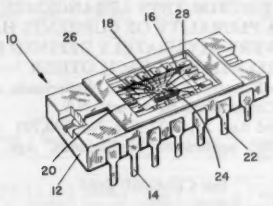
determining the desired value of the armature current with a non-actuated separating clutch means and automatic means for automatically controlling the desired value of the armature current when the separating clutch means is actuated, the improvement comprising stop relay means for influencing the braking of the electric motor, the stop relay means being energized by an ignition switch means which couples a supply of electrical power to the drive arrangement when the ignition switch means is closed, said stop relay means including contact means responsive to the opening of the ignition switch means which deenergizes the stop relay for connecting a resistor across the ends of the armature winding of the electric motor for short-circuiting the armature winding.

4,125,798

METHOD AND MEANS FOR LOCATING PROCESS POINTS ON MINIATURIZED CIRCUITS

C. Fredrick Miller, 2165 N. Glassell, Orange, Calif. 92667

Filed Apr. 11, 1977, Ser. No. 786,253
Int. Cl.[2] G05B *19/22*
U.S. Cl. 318—574 **14 Claims**



1. The method of locating rotationally displaced process points that have preassigned X and Y coordinate positions in an X, Y plane on an electronic device with the aid of a position identifier in the circumstance in which the identifier and the device are capable of relative motion parallel to said X, Y plane, which method includes the steps of:

positioning and orienting the device and the identifier such that the identifier is aligned with a home position on the device;

measuring the amount of relative movement required in the X and the Y directions to move the indentifier from a position over the preassigned X and Y coordinates of a selected bonding point to a position over the actual position of that bonding point;

converting the measurement so made into a representation of the sine or tangent of the angle of rotational displacement; and

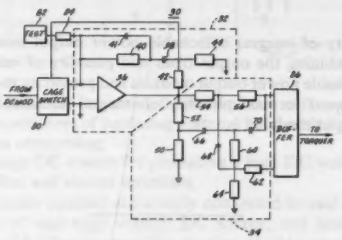
finding the position of another process point by adding to its preassigned X coordinate an X distance proportional to the product of the preassigned Y coordinate of said other process point and said representation, and by adding to the preassigned Y coordinate of said other bonding point a distance proportional to the product of the preassigned X coordinate of said other process point and said representation.

4,125,799

GYRO CAGING LOOP SYSTEM

John T. Harduvel, Huntington Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jul. 29, 1977, Ser. No. 820,219
Int. Cl.[2] G05B *6/02*
U.S. Cl. 318—621 **14 Claims**



1. A caging loop system for a gyro having two orthogonal axes, the caging loop system having a cross feed shaping network without any direct feed network, comprising:

demodulator means;

means for applying gyro pickoff signals to the demodulator means;

circuit means coupled to the demodulator means and having an output for applying signals to drive to gyro, the circuit means including an integrator; a predetermined lead-lag network intercoupled with the integrator to develop a complex zero and a complex pole at preselected frequencies, the frequency of the complex zero being lower than the frequency of the complex pole; and a complex second-order lag network coupled to the output of the integrator and providing a pair of complex zeros and a pair of complex poles at selected frequencies determined in accordance with the nutation resonance frequency of the gyro, the complex poles being at a frequency below said nutation resonance frequency and the complex zeros being at a frequency above said nutation resonance frequency.

4,125,800

POWER CONTROLLER WITH A MODULAR POWER OUTPUT

Donald H. Jones, Pittsburgh, Pa., assignor to Contraves Gorez Corporation, Pittsburgh, Pa.

Filed Sep. 2, 1975, Ser. No. 609,901
Int. Cl.[2] G05F *1/08*
U.S. Cl. 318—681 **53 Claims**

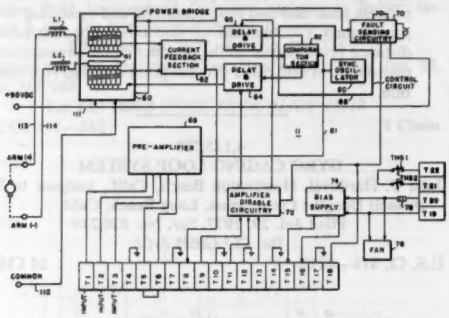
1. A power processor comprising, input means for receiving inputs into the power processor; an output section for providing an output from the power processor which has a characteristic of the input; control circuit means disposed between said input means and said output section for controlling said output means; and,

said output section comprises:

a first plurality of parallel connected integral, detachable power output modules each comprising semiconductor components for supplying a proportional amount of the output power;

protective circuitry means formed on each module for protecting some semiconductor components of said module from overvoltage during operation; and,

output combining means electrically connected to said plu-



rality of integral detachable power output modules for combining the output from said plurality of integral detachable power output modules and providing mechanical support for said plurality of integral detachable power output modules.

4,125,801

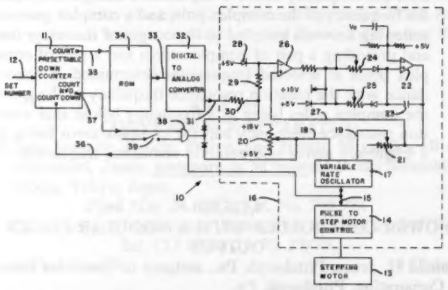
PRESETTABLE NUMBER TO STEP MOTOR CONTROL SYSTEM

Albert C. Leenhouts, Harwinton, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Aug. 22, 1977, Ser. No. 826,612

Int. Cl.[2] H02K *37/00*

U.S. Cl. 318—696 **12 Claims**



1. A system for accepting a number and causing a stepping motor to produce a movement having the same number of steps comprising a stepping motor means for producing a step essentially simultaneously with the receipt of a command pulse, variable rate oscillator means for producing command pulses, counter means for maintaining a count of the number of steps to be produced, means for directing the oscillator means to increase the rate of the command pulses at the beginning portion of the movement and means for directing the oscillator means to decrease the rate of the command pulses at the ending portion of the movement in accordance with essentially the square root of the count whereby the motor speed decreases essentially linearly.

4,125,802

METHOD AND APPARATUS FOR CHARGING STORAGE BATTERIES

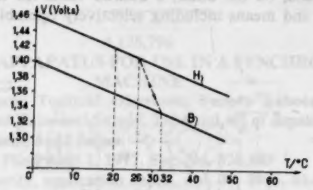
Pierre Godard, Tremblay les Gonesse, France, assignor to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed Sep. 21, 1976, Ser. No. 725,286

Claims priority, application France, Sep. 26, 1975, 75 29664

Int. Cl.[2] H02J *7/10*

U.S. Cl. 320—35 **31 Claims**



1. In a method of charging a storage battery that includes sensing battery temperature and ambient temperature, comparing the sensed temperatures to determine their difference, and providing a first charging voltage varying as a first inverse function of battery temperature defining a first high charging rate in a first temperature range in which battery temperature does not exceed ambient temperature by more than a first temperature difference, wherein the improvement comprises:

providing an intermediate charging voltage varying as a second inverse function of battery temperature defining an intermediate charging rate in an intermediate temperature range in which the battery temperature exceeds ambient temperature by at least said first temperature difference but by less than a second temperature difference that is greater than the first temperature difference, wherein at each battery temperature the voltage of said intermediate charging rate is less than the value of the first function at the same temperature by an amount that varies as a function of the battery temperature.

4,125,803

CURRENT DISTRIBUTION ARRANGEMENT FOR REALIZING A PLURALITY OF CURRENTS HAVING A SPECIFIC VERY ACCURATELY DEFINED RATIO RELATIVE TO EACH OTHER

Rudy J. Van de Plassche, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 25, 1977, Ser. No. 790,701

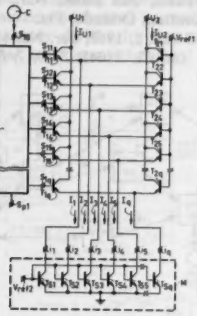
Claims priority, application Netherlands, Apr. 29, 1976, 7604570

Int. Cl.[2] G05F *1/56*

U.S. Cl. 323—1 **19 Claims**

1. A current distribution arrangement for producing a plurality p of currents having a specific very accurately defined relationship relative to each other which can be expressed in integers comprising, a multiple current source which supplies q approximately identical currents to q inputs of a coupling circuit which has p inputs, with $q > p$, control means for coupling a periodic control signal to the coupling circuit in a cyclically permuting fashion, said coupling circuit including switching means responsive to the periodic control signal for selectively interconnecting said q inputs with n of the p outputs, wherein $p \geqq n$, so as to establish a connection pattern between the q inputs and the p outputs such that each of the n outputs within a constant cycle time defined by the control signal is consecutively coupled at least once to each of the inputs during q identical time intervals, that at least one of the

n outputs is consecutively coupled at least two times to each of the *q* inputs during the *q* time intervals, and that during each



time interval none of the inputs are coupled to more than one output.

4,125,804

MOBILE RADAR METHOD FOR SENSING INCLUSIONS IN SUBSOIL

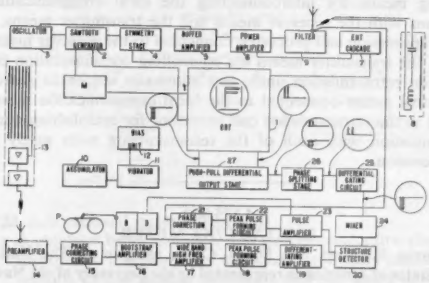
Diether Schroeder, Im Schöntal, Oedekoven, Fed. Rep. of Germany

Filed Nov. 9, 1976, Ser. No. 739,848

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1975, 2550715

Int. Cl.[2] G01V *3/12*

U.S. Cl. 324—6 **3 Claims**



1. A method for detecting and measuring inclusions contained in the subsoil comprising the steps of transmitting a continuous, unmodulated, sinusoidal electromagnetic signal towards the surface of the earth the subsoil of which is to be investigated, the wavelength of the signal being at least four times the anticipated depth of inclusions below the surface of the ground; detecting any subsequent reflection of the electromagnetic signal; converting the transmitted and reflected electromagnetic signal into two sequences of electrical pulses and displaying the two pulse sequences on a cathode ray tube display, said steps being carried out while moving over the surface of the earth in a vehicle.

4,125,805

METHOD AND APPARATUS FOR DEFECT INSPECTION OF LIQUID-FILLED INSULATING CONTAINER

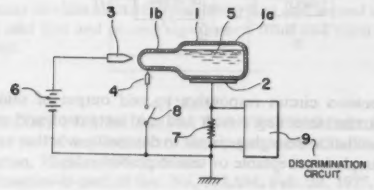
Kazuo Nagamatsu, Takarazuka; Tadao Yasuhara, Takatsuki; Masakazu Oi, Osaka, and Hideaki Maeda, Takarazuka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 7, 1977, Ser. No. 785,601

Claims priority, application Japan, Jul. 15, 1976, 51-84805; Dec. 18, 1976, 51-152620

Int. Cl.[2] G01R *31/12*; G01N *27/60*

U.S. Cl. 324—54 **35 Claims**



19. An apparatus for inspecting for defects such as flaws and emptiness in containers of insulating material filled with liquid, said apparatus comprising;

a high voltage DC source for producing a high DC voltage having first and second terminals;

a first electrode member electrically connected to said first terminal of said high voltage DC source, and held in contact with a first outer surface portion of said container;

a second electrode member connected to said second terminal of said high voltage DC source and being disposed to confront a to be tested second outer surface portion of the container at a position spaced a predetermined distance therefrom for causing the high DC voltage supplied to said first and second electrode members to allow the container to store electric energy such that the contents of the container are electrically polarized according to the polarities of electric charge at said first and second portions of the container;

an electric energy detecting means coupled to said first and second electrode members and said high voltage DC source for detecting the charged electric energy stored in the container; and

an electric energy discriminating means coupled to said electric energy detecting means for discriminating whether or not the detected energy is within a predetermined range.

4,125,806

NON-DESTRUCTIVE SCREENING DEVICE FOR GLASS DIODE

Masanori Takata, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 1, 1977, Ser. No. 773,173

Claims priority, application Japan, Mar. 3, 1976, 51-22107

Int. Cl.[2] G01R *31/22*

U.S. Cl. 324—158 D **12 Claims**

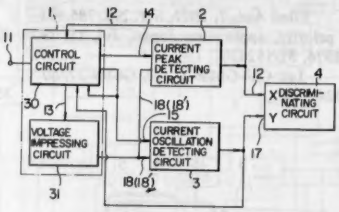
1. A non-destructive screening device for glass diode test sample comprising:

a power supply circuit for applying to said test sample a reverse voltage having a level high enough for effecting an avalanche of said test sample;

a peak current detecting circuit for detecting a peak current value in a current flowing through said test sample during plasma discharges and void discharges and generating an output when said peak current value exceeds a predetermined first level;

a current oscillation detecting circuit for detecting an A.C. component in said current flowing through said test sam-

ple due to plasma discharges only, for amplifying said A.C. component, and for detection and integration the amplified A.C. component to convert it to a D.C. level and generating an output when said D.C. level exceeds a second predetermined level; and



a decision circuit responsive to said output of said peak current detecting circuit and said output of said current oscillation detecting circuit to determine whether said test sample is acceptable or unacceptable.

4,125,807

MAGNETIC THICKNESS GAUGE HAVING CONVERTIBLE SCALES

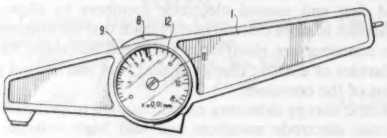
Erich A. Steingroever, Cologne, Fed. Rep. of Germany, assignor to Elektro-Physik, Cologne, Fed. Rep. of Germany

Filed Aug. 30, 1976, Ser. No. 713,578

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1976, 2630099

Int. Cl.[2] G01R *33/12*

U.S. Cl. 324—230 **8 Claims**



1. In a portable magnetic thickness gauge of the type wherein a housing contains a rotary system which supports a permanent magnet for movement toward and away from a supporting base having a layer applied thereto whose thickness is to be measured, the thickness of said applied layer being a function of the attractive force of said magnet when in contact with the applied layer on the base, said housing also containing a movable control element projecting exteriorly from said housing and spring means connected with the control element to exert force on the magnet to lift it from said surface in response to movement of the control element in one direction, the improvement which includes a rotary shaft in said housing movable with said control element and having one end projecting exteriorly or the housing, indicating means comprising two relatively rotatable elements mounted in concentric relationship respectively on said shaft and on said housing, said two elements also being rotatable with respect to the housing one of said elements having scale markings, the other of said two elements having a reference means cooperating with said scale markings to indicate the values of thickness represented by the movement of the control element to lift the magnet, the element which is provided with said scale markings being removably mounted to permit substitution of another such element provided with different scale markings the mounting for said other named element including means to adjust the initial angular relationship between said two elements.

4,125,808

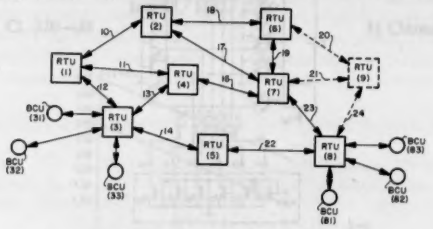
AUTOMATIC SEQUENTIAL SEARCH FOR A RADIO RELAY NETWORK

Lawrence H. Graham, Red Bank, N.J., assignor to Martin Marietta Corporation, Orlando, Fla.

Filed Jun. 1, 1965, Ser. No. 460,316

Int. Cl.[2] H04B *7/00, 7/14*

U.S. Cl. 325—55 **39 Claims**



15. A retransmission unit for a communication system including a number of mobile basic communication units, and a number of retransmission units, each basic unit being in two way communication with one of the retransmission units where requiring range extension service, and each retransmission unit having access to at least one other retransmission unit, comprising: means responsive to a request for range extension service from a calling basic communication unit, means to initiate a search for a called user by the generation of a signal representing the address of his basic communication unit; means to conduct a sequential search for such called user without the aid of area code or directional information supplied by the calling user, control means to successively establish communication with each accessible retransmission unit in turn to transmit the address of the desired basic communication unit thereto; and means responsive to the receipt of an address from one of such other retransmission units to transmit a message to the address received.

24. A communication system including a number of mobile basic communication units and a number of retransmission units, comprising: local communication means providing two way communication between the retransmission unit and a number of associated basic communication units; means for receiving messages from another retransmission unit; means for transmitting messages to another retransmission unit; coupling means for interconnecting the local communication means with the receiver means and the transmitter means; a retransmission call processor connected to the receiver means and the transmitter means for controlling communication between retransmission units; and automatic sequential search control means connected to the local communication means and to the retransmission call processor for establishing communication with each of the retransmission units singly in succession.

4,125,809

DIGITAL C/KT METER

Murray H. Mott, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 9, 1977, Ser. No. 849,738

Int. Cl.[2] H04B *17/00*

U.S. Cl. 325—363 **9 Claims**

1. A digital C/kT meter for measuring the ratio of carrier power to noise power in a one Hz bandwidth comprising:

(a) input means for receiving electromagnetic energy signals received from a satellite beacon,

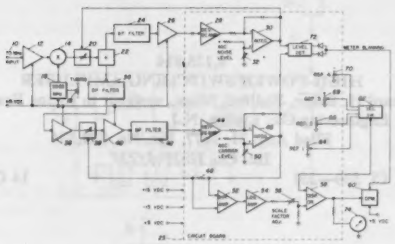
(b) first variable attenuating means coupled to said input means,

(c) power divider means coupled to said first variable attenuating means dividing the input signal into two output signals,

(d) a noise measurement channel connected to one output of

said power divider for measuring the noise level of the input signal and providing an automatic gain control signal for controlling said first variable attenuating means to maintain a constant noise level signal at the output of said first variable attenuating means,

(e) a carrier measurement channel connected to the other output of said power divider for measuring the carrier level, said carrier measurement channel including a sec-



ond variable attenuating means and providing an automatic gain control signal for controlling said second variable attenuating means to maintain a constant carrier level at the output of said second variable attenuating means and

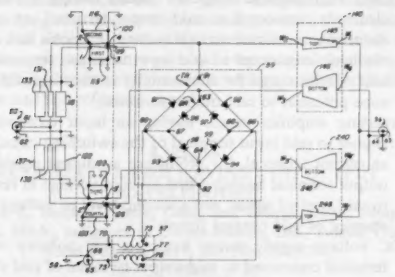
(f) circuit means connected to said carrier measurment channel and being responsive to the automatic control gain signal of said carrier measurement channel to provide an output signal proportional to C/kT.

4,125,810

BROADBAND HIGH FREQUENCY BALUNS AND MIXER

Anthony M. Pavio, Denver, Colo., assignor to Vari-L Company, Inc., Denver, Colo.

Filed Apr. 8, 1977, Ser. No. 785,858
Int. Cl.[2] H04B *1/26;* H03H *7/42*
U.S. Cl. 325—446 **27 Claims**



23. A broadband mixer comprising:

a double slot balun having a first pair of conductive sheets disposed in a substantially coplanar, electrically insulated relation to one another defining a first slot and a second pair of conductive sheets disposed in a substantially coplanar, electrically insulated relation to one another defining a second slot opposite and spaced from said first slot, said double slot balun being coupled to a first signal port for converting an unbalanced first signal applied to said first signal port to a balanced first signal;

a pair of constant impedance baluns each having a pair of spaced, alined, superposed, electrically insulated conductive strips, one of said conductive strips being tapered in relation to another to provide a constant impedance at any point along the length of said pair of conductive strips, said pair of constant impedance baluns being coupled to a second signal port for converting an unbalanced second signal applied to said second signal port to a balanced second signal, said double slot balun being connected to said pair of constant impedance baluns so that their respective signals do not pass to an opposite signal port;

third balun means coupled to a third signal port; and

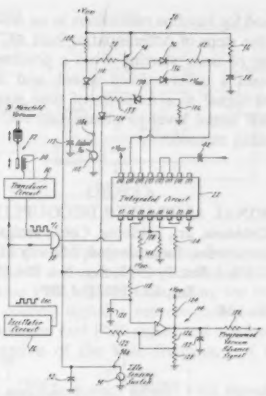
frequency converting means having a least a first set of terminals and a second set of terminals to which are applied said balanced first signal and said balanced second signal, and a third set of terminals, said frequency converting means including an arrangement of non-linear devices associated with said first, second and third sets of terminals for converting said balanced first and second signals to a balanced third signal at said third set of terminals that is conducted via said third balun means to produce an unbalanced third signal at said third signal port, said nonlinear devices electrically isolating first and second signals at said first and second signal ports from said third signal port.

4,125,811

CIRCUIT FOR MULTIPLYING TWO VARIABLES

LaVerne A. Caron, Rochester, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Continuation-in-part of Ser. No. 772,604, Feb. 28, 1977. This application Jun. 15, 1977, Ser. No. 806,876
Int. Cl.[2] H03K *9/08*
U.S. Cl. 328—160 **3 Claims**



1. A circuit for multiplying two variables to obtain a DC signal whose magnitude is proportional to the product thereof, one of said two variables being represented by the pulse width of the pulses of a constant frequency rectangular waveform but whose zero value is represented by a definite non-zero width of said pulses, the other of said variables being represented by a variable amplitude signal comprising:

means for generating a constant frequency rectangular waveform comprising pulses whose width is representative of said one variable but which have a non-zero width when the value of said one variable is zero;

means for generating a reference rectangular waveform at the same frequency as that of said constant frequency rectangular waveform;

means for producing from said constant frequency rectangular waveform and said reference rectangular waveform, a third rectangular waveform having zero pulse width when the value of said one variable is zero and having a pulse width which increases from zero as the value of said one variable increases from zero;

a variable amplitude signal source providing said variable amplitude signal;

means for producing from said third rectangular waveform and from said variable amplitude signal a fourth rectangu-

lar waveform whose pulse amplitude is representative of the level of said variable amplitude signal and whose pulse width is directly proportional to that of said third rectangular waveform;

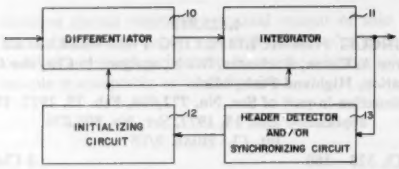
and low pass filter means receiving said fourth rectangular waveform to produce a DC signal whose magnitude is proportional to the product of said two variables.

4,125,812

APPARATUS FOR BASELINE RESTORATION IN AN AC-COUPLED SIGNAL

John D. Polonio, Canoga Park, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Jun. 17, 1977, Ser. No. 807,440
Int. Cl.[2] H04B *1/10*; H03K *5/00*
U.S. Cl. 328—162 **10 Claims**



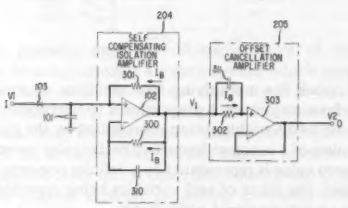
1. A method for baseline restoration in an AC-coupled signal comprising the steps of differentiating said AC coupled signal as a function of time, starting from a predetermined initital level to obtain a differentiated signal, and integrating said differentiated signal as a function of time starting from said predetermined initial level to obtain said AC-coupled signal with its baseline restored.

4,125,813

OPERATIONAL AMPLIFIER DECOUPLING CIRCUIT

Richard J. Cubbison, Jr., Littleton, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 9, 1977, Ser. No. 804,876
Int. Cl.[2] H03F *1/08*
U.S. Cl. 330—104 **7 Claims**



1. A decoupling circuit comprising:

an input terminal;

an output terminal;

isolation amplifier means having an input and an output terminal, said isolation amplifier means input terminal being connected to said decoupling circuit input terminal, said isolation amplifier means output terminal being connected to said decoupling circuit output terminal for isolating said decoupling circuit output terminal from said decoupling circuit input terminal;

wherein said isolation amplifier means generates and supplies its own dc input bias current by sensing its own dc input bias current;

input bias current compensation means connected between said isolation amplifier means output terminal and said decoupling circuit output terminal for generating a compensation signal to dynamically cancel the input bias current signal generated by said isolation amplifier means; and

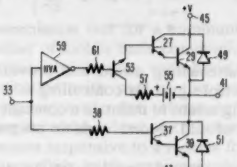
wherein said input bias current compensation means senses its own input bias current signal to generate said compensation signal.

4,125,814

HIGH-POWER SWITCHING AMPLIFIER

Richard H. Baker, Bedford, Mass., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Aug. 31, 1977, Ser. No. 829,334
Int. Cl.[2] H03F *3/217*
U.S. Cl. 330—251 **14 Claims**



1. A switching circuit comprising:

an input terminal for receiving a control signal;

an output terminal where an output signal is provided;

a first terminal for receiving an operating voltage;

a second terminal for receiving a source of reference potential;

first transistorized amplifier means having a collector, an emitter and a base electrodes, said collector electrode being connected to said first terminal, said emitter electrode being connected to said output terminal;

second transistorized amplifier means having a collector electrode connected to said output terminal, an emitter electrode connected to said second terminal, and a base electrode connected to said input terminal, responsive to said control signal for substantially connecting said reference potential to said output terminal;

inverting amplifier means having an input terminal connected to said input terminal of the switching circuit, and an output terminal, for producing an output signal at its output terminal having a first level of voltage in response to said control signal, and a second level of voltage in the absence of said control signal;

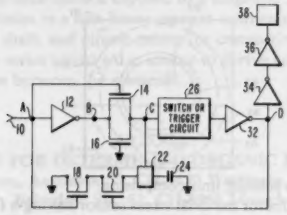
DC voltage supply means having a first polarity voltage terminal connected to said output terminal of said switching circuit, and an opposite polarity terminal; and

transistorized switching means having the same conductivity as said first amplifier means, having a collector electrode connected to said opposite polarity terminal of said DC voltage supply means, an emitter electrode connected to the base electrode of said first amplifier means, and a base electrode connected to the output terminal of said inverting amplifier means, said DC voltage supply means being polarized for feeding back current from said emitter electrode to said base electrode each of said first amplifier means, via the collector-emitter current path of said transistorized switching means whenever turned on in response to said output signal of said inverting amplifier means being at said second level of voltage, for turning on said first transistorized amplifier means, thereby substantially applying said operating voltage to said output terminal of said switching circuit.

4,125,815
PHASE LOCK LOOP INDICATOR

Barry A. Kirschner, Pittstown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 27, 1977, Ser. No. 846,198
Int. Cl.[2] H03B 3/04
U.S. Cl. 331—8 7 Claims



1. In a phase lock loop system having a voltage controlled oscillator, a reference signal, a phase comparator and a low pass filter connected as a closed loop, feedback system, the phase comparator comparing the phases of the voltage controlled oscillator and reference signals to generate at the output thereof a signal that is proportional to any difference in phase between the voltage controlled oscillator and the reference signals, an indicator circuit for the phase lock loop system, comprising:

a common node;

capacitor means connected between the common node and a point of reference potential;

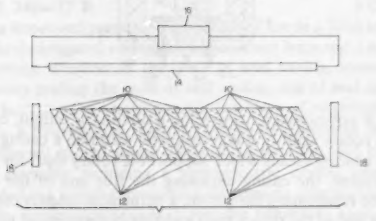
first impedance means, connected between the common node and the phase comparator output and conductive only when the phase comparator generates a first output signal signifying an out-of-lock condition between the voltage controlled oscillator and the reference signal, to charge the capacitor and indicate an unlocked relationship therebetween; and

second, conductive impedance means connected between the common node and the phase comparator output, to discharge the capacitor means and provide a signal indicative of a locked relationship therebetween only when the comparator generates a second output signal signifying an in-phase condition between the voltage controlled oscillator and the reference signals.

4,125,816
SOLID STATE LASER HAVING TWO OUTPUT WAVELENGTHS

Norman L. Boling, Toledo, Ohio, and George Dube, Temperance, Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 18, 1977, Ser. No. 769,976
Int. Cl.[2] H01S 3/16
U.S. Cl. 331—94.5 F 4 Claims



1. A laser structure which comprises, in combination:

a first plurality of solid state, plate like lasable elements having a first absorption region of white pump light and an output beam at a first wavelength, said first plurality of elements being aligned in a spaced apart array along a common optical axis;

a second plurality of solid state, plate like lasable elements having a second absorption region of white pump light and an output beam at a second wavelength, said second plurality of elements being aligned in an alternating, adjoining pattern with said first plurality of elements along said common optical axis and said first and second pluralities of elements being such that neither strongly absorbs said first and second output beam wavelengths;

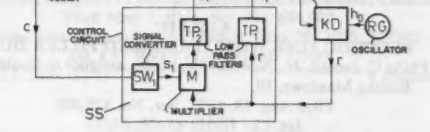
means for furnishing white pump light to said first and second elements; and

end mirror means for said array of first and second elements.

4,125,817
METHOD FOR STABILIZING THE MEAN-FREQUENCY AND MODULATION SLOPE OF A PHASE-KEYED OSCILLATOR

Felix Bagdassarjanz, Untersiggenthal, and Gustav Guanella, Zurich, both of Switzerland, assignors to Patelhold Patentverwertungs- & Elektro Holding AG, Glaurus, Switzerland

Filed Sep. 27, 1977, Ser. No. 836,976
Claims priority, application Switzerland, Sep. 28, 1976, 12230/76
Int. Cl.[2] H03C 3/00
U.S. Cl. 332—19 46 Claims



1. A method for stabilizing the mean frequency and the modulation slope of a frequency-controlled oscillator (VC) used for generating PSK signals, comprising the steps of:

generating a control signal r representative of the phase deviation between said PSK signal and a reference signal h_o representative of the base frequency of the carrier signal;

stabilizing the mean frequency of said PSK signal generated by said frequency-controlled oscillator in response to said control signal r;

inverting said control signal r as a function of a data signal a whose information is carried by said PSK signal; and

stabilizing the modulations slope of said PSK signal generated by said frequency-controlled oscillator in response to said inverted control signal r.

4,125,818
CHARGE-COUPLED DEVICES

Roger A. Haken, South Croydon; Peter C. T. Roberts, Totton; Robert G. Taylor, Portsmouth, and Christopher P. Traynar, Kettering, all of England, assignors to National Research Development Corporation, London, England

Filed Nov. 16, 1976, Ser. No. 742,182
Claims priority, application United Kingdom, Nov. 17, 1975, 47349/75
Int. Cl.[2] H03H 7/28, 7/30; H01L 29/90, 29/78
U.S. Cl. 333—70 T 3 Claims

1. A charge-coupled delay line comprising:

a signal input line;

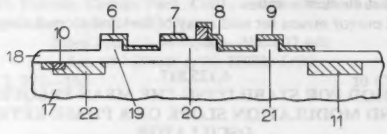
a signal output line;

a plurality of analogue storage locations connected in parallel to said input and output lines, and gating means for enabling output from each of said locations in turn in a

predetermined sequence to said signal output line and for enabling input to each of said locations in turn in said predetermined sequence from said signal input line, wherein each of said storage locations is a charge-coupled device formed on a doped semi-conducting substrate and including:

a stepped priming electrode;

a zener diode formed in said substrate and arranged to inject minority carriers into said substrate under said priming electrode;



a stepped sample-holding electrode;

a gate electrode between and adjacent to a charge-output edge of said priming electrode and a charge-input edge of said sample-holding electrode;

an output electrode having a charge-input edge adjacent to a charge-output edge of said sample-holding electrode; and

an output channel formed in the said substrate and extending under said output electrode for capturing minority-carrier charges.

4,125,819

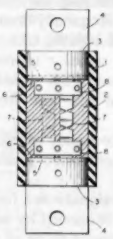
ELECTRIC FUSE WITH EQUALIZED FILLER DUTY

Philip C. Jacobs, Jr., Newtonville, Mass., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Aug. 19, 1977, Ser. No. 825,980

Int. Cl.[2] H01H *85/08, 85/12*

U.S. Cl. 337—293 **4 Claims**



1. A current-limiting fuse including

(a) a tubular casing of electric insulating material;

(b) a pulverulent arc-quenching filler inside said casing;

(c) a pair of terminal plugs closing the ends of said casing, said pair of terminal plugs having grooves arranged in the same plane across the axially inner end surfaces thereof;

(d) a pair of fusible elements connected in parallel, having their ends in said grooves, each of said pair of fusible elements having a center region bent in opposite directions and each of said pair of fusible elements having axially outer regions which are straight, arranged in the plane defined by said grooves and displaced in a direction longitudinally of said grooves; and

(e) two pairs of plates of electric insulating material each arranged immediately adjacent said axially inner end surfaces of said pair of terminal plugs and each sandwiching said axially outer regions of said pair of fusible elements which are straight; and said pair of plates firmly positioning said pair of fusible elements relative to said casing and relative to the axis thereof.

4,125,820

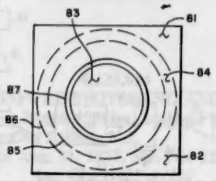
STRESS SENSOR APPARATUS

James F. Marshall, St. Paul, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 619,866, Oct. 6, 1975, abandoned. This application Sep. 20, 1976, Ser. No. 724,827

Int. Cl.[2] G01L *1/22*

U.S. Cl. 338—4 **44 Claims**



1. A stress sensing unit comprising:

a semiconductor material stress sensor having a first surface, said stress sensor having structural portions including substantially in a crystalline relationship a diaphragm and a constraint for constraining said diaphragm at peripheral portions thereof with said diaphragm portion being formed by a recess in said semiconductor material stress sensor which opens onto said first surface resulting in an outline of said recess in said first surface where said first surface is formed by said constraint portions; and

a mounting structure of a material of another kind from that in said semiconductor material stress sensor, said mounting structure being bonded to said semiconductor material stress sensor at bonded surfaces in said first surface contained within a closed surface band in turn contained within said first surface to thereby form a bond, said surface band having an inner outline everywhere substantially equidistant from said recess outline and having an outer outline also everywhere substantially equidistant from said recess outline with said inner and outer outlines being separated just enough to include that bonded surface portion having maximum extent perpendicular to said inner and outer outlines.

4,125,821

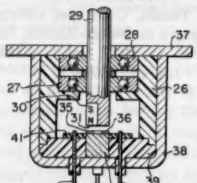
POTENTIOMETER PROVIDING A NON-LINEAR OUTPUT

Noboru Masuda, Tokyo, Japan, assignor to Denki Onkyo Company, Limited, Japan

Filed Aug. 5, 1977, Ser. No. 822,331

Int. Cl.[2] H01L *43/08*

U.S. Cl. 338—32 R **12 Claims**



1. A potentiometer providing a non-linear output, comprising a rotary shaft of a non-magnetic material, a casing including a bearing means which support the rotary shaft for angular movement, the casing enclosing the free end of the shaft in spaced relationship therefrom, a permanent magnet carried by a free end of the rotary shaft and axially magnetized to present a pole face aligned with a plane perpendicular to the shaft, a mount of a magnetizable material disposed within the casing in parallel opposed relationship with the pole face of the permanent magnet with a small clearance therebetween whereby a magnetic field is established between the pole face and the

mount, a pair of magnetic resistance effect semiconductor elements mounted on the mount and separated from each other, the elements each having a sensor surface, the sensor surfaces of the elements being located on the opposite sides of an imaginary line lying in a plane perpendicular to the axis of the shaft and disposed symmetrically with each other with respect to the imaginary line or a point of intersection between the line and the axis, each of the sensor surfaces being shaped such that an area thereof exposed to a magnetic flux from the pole face varies in a non-linear manner with an angle of rotation of the shaft, and circuit means for connecting the pair of elements in series across a d.c. source to derive an output from the junction between the elements.

4,125,822

PROBE FOR DETERMINING ORGANIC LIQUIDS

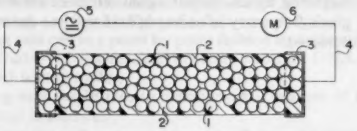
Benno Perren, Austrasse 33, CH-5430 Wettingen, and Herbert Schreiber, Belvedere Str. 63, CH-8968 Mutschellen, both of Switzerland

Continuation of Ser. No. 408,573, Oct. 23, 1973, abandoned. This application Oct. 20, 1975, Ser. No. 624,243

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1972, 2251952; Sep. 5, 1973, 2344778

Int. Cl.[2] **G01N** *27/04*

U.S. Cl. 338—34 **2 Claims**



1. A probe for determining the presence of mineral oil, which comprises:

a plastics material which is swellable on contact with mineral oil, and

solid particles finely distributed through said material and present therein in such concentration as to touch each other, said solid particles being less than 1.0 mm in diameter and having a surface conductivity of the order of a metal,

at least at the surface thereof the probe comprises an adsorption material having a preferential attraction toward mineral oil.

4,125,823

SEISMIC TRANSDUCER FOR MARSHY TERRAINS

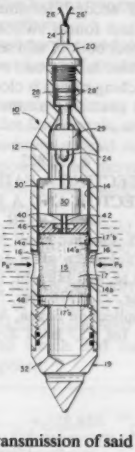
Ernest M. Hall, Jr., Houston, Tex., assignor to Western Geophysical Co. of America, Houston, Tex.

Continuation-in-part of Ser. No. 704,148, Jul. 12, 1976, Pat. No. 4,092,628. This application Jul. 18, 1977, Ser. No. 816,786

Int. Cl.[2] **G01V** *1/00;* **H04B** *13/00;* **H04R** *15/00*

U.S. Cl. 340—17 R **3 Claims**

1. An improved pressure transducer for use in a fluid including a rigid elongated casing having an inner bore and a sound-transmitting window in the wall of said casing, means for detachably sealing the ends of said casing, one of said sealing means having a fluid-tight conduit for entry of electrical conductors, a hydrophone assembly removably disposed in said bore adjacent to said sound transmitting window, said hydrophone assembly including a piezo-electric crystal assembly embedded in a sound-transmitting elastomeric core having two mutually perpendicular axes, means for adjustably applying a compressive force to said core in a direction along a first axis so that portions of said core expand radially outwardly to effect sealing engagement against the wall of said bore to block said fluid from penetrating into the bore of said casing through said sound-transmitting window beyond the sealing-engaging portions of said core, wherein the improvement comprises:



means for blocking transmission of said compressive force to said embedded crystal assembly.

4,125,824

ALARM CIRCUIT

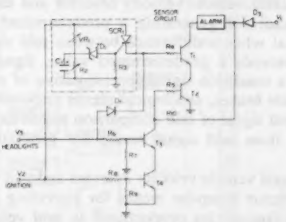
Ernest W. McPherson, and Jonn C. Barss, both of Dartmouth, Canada, assignors to Barmac Electronics, Dartmouth, Canada

Filed May 7, 1976, Ser. No. 684,089

Claims priority, application Canada, May 20, 1975, 227381

Int. Cl.[2] **B60Q** *11/00;* **G08B** *23/00*

U.S. Cl. 340—52 D **5 Claims**



1. An alarm circuit comprising a first terminal means adapted for connection to a supply potential source, an alarm means capable of being energized by said supply potential and connected between said first terminal means and a reference ground potential point through first and second series-connected switching means; third and fourth series-connected switching means connected between said first terminal means and a reference ground potential point; each of said first, second, third and fourth switching means having a control electrode for selectively enabling or disabling said switching means in accordance with the potential at the respective control electrode; said control electrode of said first switching means further being connected through a series-connected first unidirectional current passing means and a sensing circuit to second terminal means and, the control electrode of said first switching means being connected through second unidirectional current passing means to third terminal means, whereby said first switching means closes in response to potential from said third terminal means and said sensing circuit, said first and second unidirectional current passing means isolating said second and third terminal means from one another whilst providing current paths therethrough from said second and

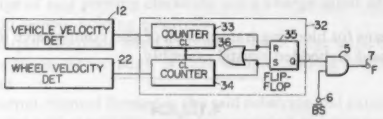
third terminal means respectively to said control electrode of said first switching means; and the control electrodes of said second, third and fourth switching means being connected to said first, third and second terminal means, respectively, whereby said third and fourth switching means close in response to potential from both of said second and third terminal means and thereby cause said second switching means to open, and said second switching means is closed when at least one of said third and fourth switching means is open.

4,125,825

SYSTEM FOR DETECTING A FAILURE IN A VEHICLE VELOCITY DETECTOR AND A WHEEL VELOCITY DETECTOR

Yasuhisa Takeuchi, Yokosuka; Kenji Maio, Hinode, and Junichiro Matsumoto, Yokosuka, all of Japan, assignors to Nissan Motor Company, Ltd. and Hitachi, Ltd., both of, Japan

Filed Apr. 27, 1976, Ser. No. 680,865
Claims priority, application Japan, Apr. 30, 1975, 50-51393
Int. Cl.² B60T *8/10*
U.S. Cl. 340—52 B **7 Claims**



1. A failure detecting system for detecting failure in an automatic brake control system for vehicles, comprising a vehicle velocity detector which provides a vehicle velocity signal proportional to detected vehicle velocity, a wheel velocity detector which provides a wheel velocity signal proportional to detected wheel velocity, comparison means responsive to said vehicle velocity signal and said wheel velocity signal from said vehicle velocity detector and said wheel velocity detector for generating a predetermined comparison output signal when a difference between said signals of said detectors exceeds a predetermined value, signal means for generating a condition signal representative of non-actuation of the vehicle brakes, and logical means responsive to receipt of said output signal of said comparison means and said condition signal from said signal means for generating a failure signal,

wherein said vehicle velocity detector and said wheel velocity detector comprise means for providing pulse signals having frequencies proportional to said vehicle velocity and said wheel velocity, respectively, and wherein said comparison means comprises first and second counting means responsive to the pulse signals from said vehicle velocity detector and said wheel velocity detector, respectively, for providing outputs when the count values thereof reach predetermined values different from each other, respectively, and output means for generating said comparison output signal in response to the output of one of said counting means and to prevent said comparison output signal from being generated in response to the output of the other counting means.

4,125,826

ULTRASONIC VEHICLE ALARM SYSTEM

Fred M. Rasmussen, 1432 Thunderbird, Sunnyvale, Calif. 94087, and John S. Dour, 1155 Danbury, San Jose, Calif. 95129

Filed Jan. 5, 1977, Ser. No. 756,902
Int. Cl.² B60R *25/10*
U.S. Cl. 340—63 **9 Claims**

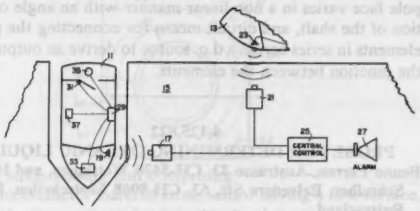
1. A vehicle alarm system, comprising:

a transmitter adapted for installation in said vehicle, said transmitter characterized by periodically emitting given length bursts of ultrasonic energy of a given frequency,

means adapted to be installed in a permanent location for receiving the ultrasonic energy from the transmitter and converting it into an electrical signal representative thereof,

means responsive to the electrical signal output of the receiving means for examining whether its frequency is substantially equal to said given frequency,

means responsive to the frequency examining means for determining whether a receiving means signal output



burst of substantially said given frequency has a time duration in excess of a set time that is less than said given length of said bursts, and

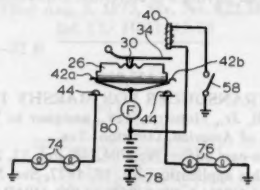
means responsive to said time duration determining means for developing an alarm signal when a given number of receiving means output signal bursts of substantially said given frequency in excess of said set time duration are not detected.

4,125,827

AUTOMATICALLY CANCELLING TURN SIGNAL

Robert D. Roudebush, Jr., Rt. #2, Box 214, Long Grove, Ill. 60047

Filed Sep. 17, 1973, Ser. No. 397,675
Int. Cl.² B60Q *1/34*
U.S. Cl. 340—73 **15 Claims**



11. An automatically cancelling turn signal for motorcycles and the like having a foot-operated gear shifting lever comprising: left and right turn indicator lights; slide-type switch means including a sliding member having cammed detent means defining left, center, and right positions for said sliding member; biasing means biasing said sliding member towards said center position; a cam follower engaging said detent means for holding said sliding member in any of said positions; cam follower biasing means biasing said cam follower toward said detent means; cam follower disengagement means comprising an electromagnet operatively connected to disengage said cam follower from said detent means; and switch means in said gearshift lever for activating said electromagnet responsive to foot pressure in an upshift direction.

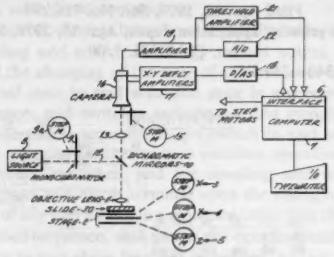
4,125,828
METHOD AND APPARATUS FOR AUTOMATED CLASSIFICATION AND ANALYSIS OF CELLS

Jerome B. Resnick, Trenton, N.J., and John W. Combs, Annville, Pa., assignors to Med-El Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 277,992, Aug. 4, 1972, abandoned. This application Jul. 17, 1975, Ser. No. 596,964

Int. Cl.[2] G01N *33/16*

U.S. Cl. 340—146.3 CA **15 Claims**



1. A method for analyzing blood cell types in a specimen of cells emplaced upon a slide in a non-over-lapping fashion and stained with fluorescent material comprising the steps of:

illuminating a cell with light of a first wavelength;

scanning said cell in a point by point fashion to determine the amplitudes of fluorescing nuclear material DNA at a second wavelength;

summing said amplitudes to determine the amount of DNA material in said cell;

rescanning the cell in a point by point fashion to determine the amplitudes of fluorescing cytoplasmic material RNA at a third wavelength;

summing the amplitudes to determine the amount of RNA material in said cell, forming a ratio of said summed amplitudes and, comparing said ratio against stored predetermined values to determine cell type.

4,125,829
MULTIPLE FORMAT PRINT PATTERN GENERATING APPARATUS

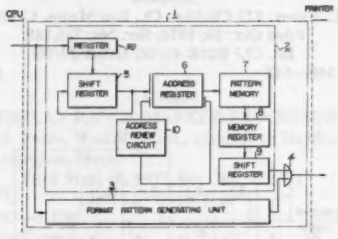
Kozo Kayashima, Isehara, Japan, assignor to Hitachi, Ltd., Japan

Filed Jan. 12, 1977, Ser. No. 758,793

Claims priority, application Japan, Jan. 21, 1976, 51-4911

Int. Cl.[2] G06F *3/14*

U.S. Cl. 340—324 AD **4 Claims**



1. A print pattern generating apparatus for generating a print pattern including information relating to characters and formats to be printed, said apparatus comprising:

a character pattern generator for producing a pattern of characters to be printed on a printing medium as a plurality of successively produced character dot line signals, each including character dot line information relating to a part of said character pattern to be disposed in an incremental linear area extending from one end to the other over the whole width of said printing medium, said character dot line signals being produced successively in an order corresponding to the arrangement of said characters on said printing medium,

a format pattern generator for producing a format pattern of a format to be printed on said printing medium, said generator comprising

format dot line information memory means for storing only different format dot line signals, each of said format dot line signals representing at least one part of said format pattern to be disposed in an incremental linear area extending from one end to the other over the whole width of said printing medium,

means for selectively reading out said format dot line signals in an order so as to constitute said format pattern, and

means for superimposing each of said successively produced character dot line signals on a corresponding one of said successively read-out format dot line signals which is to be disposed in the same incremental area of said printing medium as that to which said each character dot line signal is to be disposed.

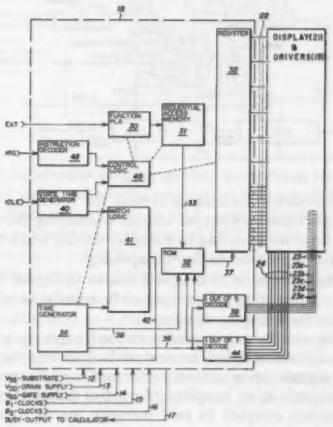
4,125,830
ALPHANUMERIC DISPLAY SYSTEM

Michael J. Cochran, Richardson, and Stephen P. Hamilton, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 439,474, Feb. 2, 1974, abandoned, which is a continuation-in-part of Ser. No. 428,492, Dec. 26, 1973, Pat. No. 4,020,465. This application Feb. 17, 1976, Ser. No. 658,793

Int. Cl.[2] G06K *15/18*

U.S. Cl. 340—336 **23 Claims**



1. An alphanumeric display system for actuating a plurality of groups of display elements, said display elements in each one of said groups being correspondingly disposed to provide an alphanumeric representation upon actuation of selected display elements, said alphanumeric display system comprising:

(a) input means for receiving digital input data;

(b) memory means, operatively connected to said input means, for temporarily storing data received by said input means,

(c) first means, operatively connected to said memory means, for permanently storing alphanumeric character display codes and for converting said data into a plurality of alphanumeric character display words corresponding to said data;

(d) second means, operatively connected to said first means,

for reading out a sequentially selected bit from each of said words; and

(e) third means operatively connected to said second means for actuating a selected display element in response to each said sequentially selected bit from each of said words corresponding to said data.

21. A method of actuating a plurality of groups of display elements, said display elements being correspondingly disposed in such each of said groups to provide an alphanumeric representation in response to input data, said method comprising:

(a) permanently storing a plurality of alphanumeric character display codes;

(b) converting said input data into alphanumeric character display words corresponding to said input data and temporarily storing a sequentially selected bit from each of said alphanumeric display words; and

(c) sequentially actuating selected display elements in response to said sequentially selected bit from each of said words.

4,125,831

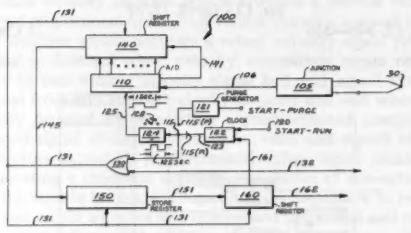
SELF-CONTAINED DATA ACQUISITION DEVICE

Richard A. Mazur, Downers Grove, and Ralph E. Martin, Oak Lawn, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Continuation of Ser. No. 470,173, May 15, 1974, abandoned. This application Mar. 9, 1977, Ser. No. 775,842

Int. Cl.[2] H03K *13/02*

U.S. Cl. 340—347 AD **6 Claims**



1. An information translating system for receiving digital voltage signals from an external source, translating the signals into analog form for coupling to a display device and retaining the signals for repetitive display comprising

switch means actuable to couple a source of digital voltage signals representing information to be translated into analog form for a display device,

memory means having a predetermined capacity to store digital signals coupled to said switch means to retain digital signals upon actuation thereof, and to pass said digital signals upon coupling of control pulses thereto,

register means coupled to said memory means to receive digital signals therefrom and having a first output coupling said digital signals to converting means for transforming said signals to analog form, and a second output passing said signals to said switch means,

converting means coupled to said register means to receive digital signals therefrom and transform said signals into analog form,

comparator means coupled to said register means for generating a command signal upon a predetermined pattern of digital signals being coupled from said register means to said converting means,

said command signal being coupled to said switch means to inhibit coupling the source of digital voltage signals thereto and to establish a coupling of the serial output of said second register means to said memory means, and

said command signal actuable to inhibit the coupling of control pulses to said memory means thereby terminating the digital signals passed thereby to said register means for coupling to said digital to analog converting means.

4,125,832

DIGITAL INFORMATION CONVERSION SYSTEM

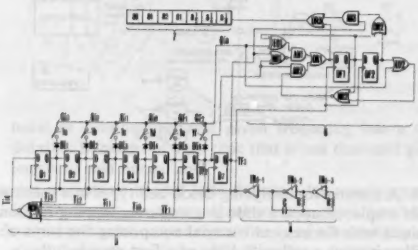
Nobuhiko Shinoda, Tokyo; Nobuaki Sakurada; Tadashi Ito, both of Yokohama; Masayoshi Yamamichi, Kawasaki; Hiroyasu Murakami, and Masayuki Suzuki, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo

Filed Apr. 12, 1977, Ser. No. 786,797

Claims priority, application Japan, Apr. 15, 1976, 51-42940

Int. Cl.[2] H04L *3/00*

U.S. Cl. 340—347 DD **13 Claims**



1. A code conversion circuit comprising:

(a) a digital information setting means which has a code pattern portion representing a gray-coded integer part and a code pattern portion consisting of first and second bits representing a decimal part varying with $\frac{1}{4}$ increment or decrement steps, wherein the code pattern of the first and second bits will have a first code pattern when said integer part represents an odd number, and will have a second code pattern when said integer part represents an even number, while values with $\frac{1}{4}$ step variation are set as digital values; and

(b) a conversion circuit connected to said digital information setting means, wherein said conversion circuit converts a gray-coded integer part into a binary code representing an integer based on the code of the code pattern portion representing said gray-coded integer part, and converts said decimal part with $\frac{1}{4}$ step variation by the code pattern of the first and second bits.

4,125,833

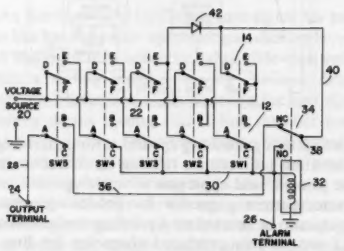
SEQUENCE SWITCHING CIRCUIT WITH LATCHING ALARM

Donald L. Ravey, 127 Chukker Ct., San Mateo, Calif. 94403

Filed Oct. 26, 1976, Ser. No. 735,188

Int. Cl.[2] E05B *45/06;* **G08B** *29/00*

U.S. Cl. 340—542 **12 Claims**



1. A sequence switching circuit including a plurality of switches in combination with a source of energy for control-

ling the coupling of said source of energy either to an output terminal or to an alarm terminal as a function of the sequence of switch state changes, each said switch including an upper switch portion and a lower switch portion, each said upper and lower switch portion including a swing terminal and a first and second terminal, each said upper and lower switch portion having a conducting path between its said swing terminal and said second terminal when said switch portion is in an original state, and having a conducting path between its swing terminal and said first terminal when said switch portion is in an actuation state, said circuit comprising:

interconnection means between said plurality of switches for coupling said source of energy to said output terminal upon the changing of the state of said switches from said original state to said actuation state in a predetermined sequence, said switches including a first switch in said predetermined sequence, a last switch in said sequence, and a plurality of intermediate switches operatively positioned therebetween, and for coupling said source of energy to said alarm terminal upon the changing of the state of any said switch in a sequence other than the predetermined sequence, said means for coupling said energy source to said alarm terminal including:

(1) means for coupling said energy source to said upper swing terminal of each said intermediate switch and said last switch;

(2) means for enabling a conducting path from one of said upper terminals in each intermediate switch and said last switch to said alarm terminal, when such switches are in said original state, such that when any said switch is changed to its actuation state in any sequence other than the predetermined sequence, a conducting path is caused to be generated from said energy source to said alarm terminal;

(3) means for coupling said alarm terminal to one of said lower terminals of each said first and intermediate switch; and

(4) means for enabling a conducting path from said lower swing terminal in each said first and intermediate switch to said energy source when such switches are in said actuation state as a function of said predetermined sequence, except when the switch was the last switch to be changed to an actuation state in said predetermined sequence, such that when any said switch is changed to its original state, a conducting path is caused to be generated from said energy source to said alarm terminal; and

continuation means for retaining said switching circuit in a condition wherein said energy source is coupled to said alarm terminal.

4,125,834

DISPLAY RANGE MARKER PROCESSOR

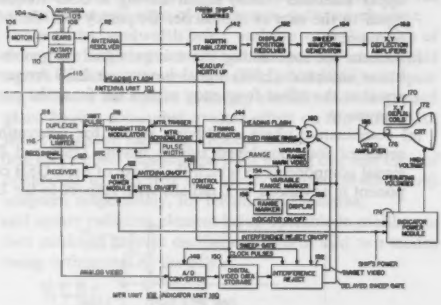
William M. Pease, Weston, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Mar. 14, 1977, Ser. No. 777,371
Int. Cl.[2] G01S 7/22
U.S. Cl. 343—5 EM **12 Claims**

1. In combination:

means for producing a display representing radar return signals, said display producing means comprising means for selecting among a plurality of radar range settings and means for producing a range mark, the position of said range mark being variable by an operator actuable control; and

means for producing a digital display of the distance represented by said range mark from a predetermined position, said digital display producing means comprising a permanently programmed memory and arithmetic processing



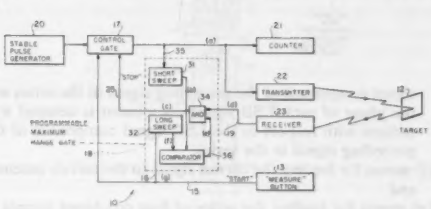
means operating in response to said permanently programmed memory.

4,125,835

RANGE OR TIME-DELAY DETERMINING SUBSYSTEM FOR USE IN CERTAIN RADAR-LIKE SYSTEMS

John N. Barry, Kanata, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Canada

Filed Sep. 19, 1977, Ser. No. 834,565
Int. Cl.[2] G01S 9/06, 9/02
U.S. Cl. 343—13 R **9 Claims**



1. An echo-pulse ranging method comprising transmitting a series of pulses of energy capable of being reflected from a target, consecutive pulses in said series being spaced apart in time by a predetermined interval (T_o), listening for an echo-pulse from said target for a time after each of a plurality of said transmitted pulses, said listening time being varied in a substantially linear manner for consecutive transmitted pulses from substantially zero to a maximum times less than said predetermined interval, and counting the number of transmitted pulses from the beginning of the measurement interval until an echo is received, the number of transmitted pulses counted until said echo is received being proportional to the distance to said target.

4,125,836

ELECTRICALLY SCANNED ANTENNA SYSTEM AND MODULATOR FOR OMNIDIRECTIONAL RADIO RANGE

Gus Stavis, Wayne, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Jan. 25, 1978, Ser. No. 872,331
Int. Cl.[2] G01S 1/08
U.S. Cl. 343—102 **12 Claims**

6. An antenna system for using a carrier signal and an offset signal to generate an amplitude-modulated signal directly related to bearing to the antenna system, which comprises:

(a) a carrier antenna;

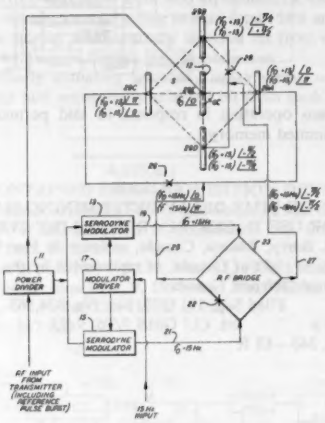
(b) four sideband antennas equidistant from the carrier an-

tenna and with an equal angular displacement of $\pi/2$ radians between adjacent sideband antennas;

(c) means for modulating the carrier signal to generate an upper sideband (USB) signal having a USB frequency equal to the sum of the carrier frequency and the offset frequency;

(d) means for modulating the carrier signal to generate a lower sideband (LSB) signal having an LSB frequency equal to the offset frequency subtracted from the carrier frequency;

(e) combinative phase modifying means for generating a series of four combined signals having USB and LSB signal components in which the phase of each USB component is advanced $\pi/2$ radians with respect to the USB



signal component of the preceding signal in the series and the phase of each LSB signal component is delayed $\pi/2$ radians with respect to the LSB signal component of the preceding signal in the series;

(f) means for feeding the carrier signal to the carrier antenna; and

(g) means for feeding the series of four combined signals to the four sideband antennas so that proceeding around the sideband antennas in a chosen direction the signal fed to each sideband antenna has a USB signal component advanced $\pi/2$ radians with respect to the USB signal component fed to the preceding sideband antenna and an LSB signal component delayed $\pi/2$ radians with respect to the LSB signal component fed to the preceding antenna.

4,125,837

DUAL NOTCH FED ELECTRIC MICROSTRIP DIPOLE ANTENNAS

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 740,692, Nov. 10, 1976, Pat. No. 4,067,016. This application Oct. 6, 1977, Ser. No. 840,082

Int. Cl.[2] **H01Q** *1/38, 9/38, 1/48*

U.S. Cl. 343—700 MS **8 Claims**

1. A dual notch fed electric microstrip dipole antenna having low physical profile and conformal arraying capability, comprising:

a. a thin ground plane conductor;

b. a thin square radiating element spaced from said ground plane;

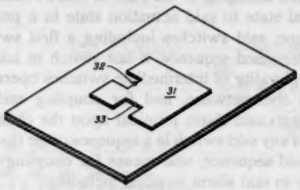
c. said square radiating element being electrically separated from said ground plane by a dielectric substrate;

d. said square radiating element having a first feed point located along the centerline of the length thereof and a second feed point located along the centerline of the width thereof, said first and second feed points being equidistant from the center of said square radiating element;

e. said square radiating element having a first notch extending into said square radiating element from the outer edge thereof along the centerline of the length to said first feed point and having a second notch extending into said square radiating element from the outer edge thereof along the centerline of the width to said second feed point;

f. the length of said square radiating element determining the resonant frequency of said antenna;

g. the antenna input impedance being variable to match most practical impedances as said feed points are equidistant



moved along said respective length and width centerlines between the square radiating element center point and the edge of the square radiating element;

h. the antenna bandwidth being variable with the width of the square radiating element and the spacing between said square radiating element and said ground plane, said spacing between the square radiating element and the ground plane having somewhat greater effect on the bandwidth than the square radiating element width;

i. said radiating element being operable to oscillate in two modes of current oscillation, each of said two modes being orthogonal to the other.

4,125,838

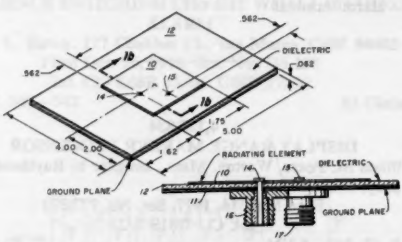
DUAL ASYMMETRICALLY FED ELECTRIC MICROSTRIP DIPOLE ANTENNAS

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 740,692, Nov. 10, 1976, Pat. No. 4,067,016. This application Oct. 6, 1977, Ser. No. 840,080

Int. Cl.[2] **H01Q** *1/38, 9/38, 1/48*

U.S. Cl. 343—700 MS **7 Claims**



1. A dual asymmetrically fed electric microstrip dipole antenna having low physical profile and conformal arraying capability, comprising:

a. a thin ground plane conductor;

b. a thin square radiating element spaced from said ground plane;

c. said square radiating element being electrically separated from said ground plane by a dielectric substrate;

d. said square radiating element having a first feed point

located along the centerline of the length thereof and a second feed point located along the centerline of the width thereof, said first and second feed points being equidistant from the center of said square radiating element and in from the outer edge of said square radiating element;

e. said square radiating element being fed at said first and second feed points from a first and from a second coaxial-to-microstrip adapter, respectively, the center pin of said first and second adapters extending through said ground plane and dielectric substrate to said respective feed points on said square radiating element;

f. the length of said square radiating element determining the resonant frequency of said antenna;

g. the antenna input impedance being variable to match most practical impedances as said feed points are equidistantly moved along said respective length and width centerlines between the square radiating element center point and the edge of the square radiating element in either direction without affecting the antenna radiation pattern;

h. the antenna bandwidth being variable with the width of the square radiating element and the spacing between said square radiating element and said ground plane, said spacing between the square radiating element and the ground plane having somewhat greater effect on the bandwidth than the square radiating element width;

i. first and second transmission lines having one end thereof connected to said first and second coaxial-to-microstrip adapters, respectively, for feeding said antenna.

4,125,839

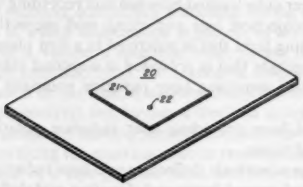
DUAL DIAGONALLY FED ELECTRIC MICROSTRIP DIPOLE ANTENNAS

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 740,692, Nov. 10, 1976, Pat. No. 4,067,016. This application Oct. 6, 1977, Ser. No. 840,081

Int. Cl.[2] H01Q *1/38, 9/38, 1/48*

U.S. Cl. 343—700 MS **6 Claims**



1. A dual diagonally fed electric microstrip dipole antenna having low physical profile and conformal arraying capability; comprising:

a. a thin ground plane conductor;

b. a thin square radiating element for producing a radiation pattern being spaced from said ground plane;

c. said square radiating element being electrically separated from said ground plane by a dielectric substrate;

d. said square radiating element having a first feed point located along one diagonal line of the element and a second feed point located along the other diagonal line of the square radiating element, said diagonal lines being normal to one another; said first and second feed points being equidistant from the center point of said square radiating element and in from the outer edge of said square radiating element;

e. said square radiating element being fed at said first and second feed points from a first and from a second coaxial-to-microstrip adapter, the center pin of said first and second adapters extending through said ground plane and dielectric substrate to said respective feed points on said square radiating element;

f. the length of said square radiating element determining the resonant frequency of said antenna;

g. the antenna input impedance being variable to match most practical impedances as said feed points are equidistantly moved along said respective diagonal lines between the center point and edge of said square radiating element;

h. the antenna bandwidth being variable with the width of the square radiating element and the spacing between said square radiating element and said ground plane, said spacing between the square radiating element and the ground plane having somewhat greater effect on the bandwidth than the square radiating element width;

i. first and second transmission lines having one end thereof connected to said first and second coaxial-to-microstrip adapters, respectively, for feeding said antenna;

j. said square radiating element being operable to oscillate in two modes of current oscillation, each of said two modes being orthogonal to the other.

4,125,840

BROAD BAND DIPOLE ANTENNA

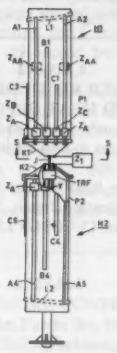
Knut E. Cassel, Järfälla, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 16, 1976, Ser. No. 751,445

Claims priority, application Sweden, Dec. 18, 1976, 7514395

Int. Cl.[2] H01Q *9/28, 1/00, 1/26, 9/30*

U.S. Cl. 343—807 **12 Claims**



1. In a broad band dipole antenna having at least one dipole element adapted to be fed at one end thereof, said dipole element comprising a plurality of groups of sub-elements, the sub-elements of each group having the same electrical length and the sub-elements of different groups having different electrical lengths, the longest sub-elements being electrically connected together at the other end of said dipole element, whereby said antenna has broad band characteristics; the improvement comprising series reactances in the longer of said sub-elements for inhibiting excitation thereof at frequencies higher than those corresponding to its length, said series-reactances being each formed by the input impedance of a resonator extending along portions of said longer sub-elements, said resonator having an input facing said one end of said dipole element.

4,125,841

SPACE FILTER

Benedikt A. Munk, Columbus, Ohio, assignor to Ohio State University Research Foundation, Columbus, Ohio

Filed May 17, 1977, Ser. No. 797,798

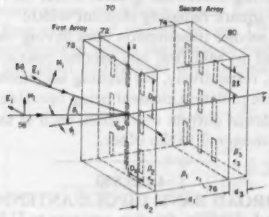
Int. Cl.[2] H01R *15/10*

U.S. Cl. 343—909 **17 Claims**

1. A composite space filter for use in conjunction with electromagnetic radiation incident thereto over a range of angles of incidence comprising:

frequency bandwidth determinant means including at least one sheet configured to define a periodic array of recurrent filter components for deriving a predetermined frequency bandwidth performance; and

first and last outwardly disposed strata of dielectric material respectively disposed in parallel adjacency at opposite surfaces of said frequency bandwidth determinant means, said first and last strata having respective thicknesses and equivalent dielectric constant configuration to exhibit a



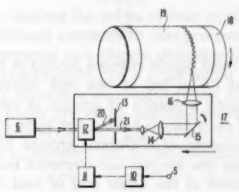
conductance transformation ratio which varies with said angle of incidence to effect a constant conductance through said frequency bandwidth determinant means over said range of angles of incidence.

4,125,842

METHOD FOR LASER RECORDING USING ZEROTH ORDER LIGHT AND HEAT DEFORMABLE MEDIUM

Masahiro Ohnishi; Hiroshi Oono, and Katutosi Tozaki, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Filed Nov. 8, 1976, Ser. No. 739,776
Claims priority, application Japan, Nov. 10, 1975, 50-135309
Int. Cl.[2] G01D *15/14*
U.S. Cl. 346—1 **2 Claims**



1. In a method of information recording including the steps of generating a beam of laser light having a plurality of oscillation wave lengths, and modulating said laser light by acousto-optical diffraction in accordance with an input information signal to produce diffracted, relatively low energy first order light and relatively high energy zeroth order light, said zeroth order light comprising undiffracted light and undiffractable light, the improvement comprising:

(a) employing a heat sensitive recording material having a threshold deformation level,

(b) optically directing said zeroth order light against the surface of said recording material, whereby said zeroth order light is employed as the information recording signal, and

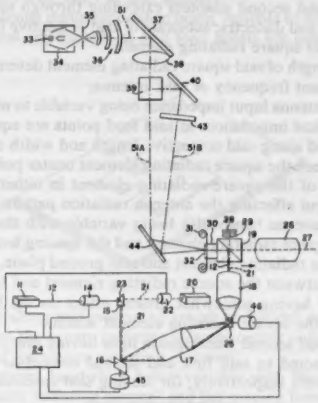
(c) preheating with said undiffractable light the recording material at the position where the information is to be recorded next, the intensity of said undiffractable light not being greater than said threshold deformation level.

4,125,843

METHOD AND APPARATUS FOR RECORDING AND PROJECTING IMAGES

Clyde M. Whitby, Valencia, Calif., assignor to The Singer Company, New York, N.Y.

Filed Oct. 14, 1977, Ser. No. 842,142
Int. Cl.[2] G01D *9/32, 7/02*
U.S. Cl. 346—17 **11 Claims**



1. A recording and projection system comprising;

a projection lens having a projection axis,

image recording medium located at the object plane of said projection lens and positioned substantially perpendicular to said projection axis,

said recording medium normally having an opaque state that is changed into a transparent state where exposed to focused laser radiation,

a polarizer cube located between said recording medium and said projection lens and along said projection axis for reflecting light that is polarized in a first plane and transmitting light that is polarized in a second plane,

a first laser providing laser radiation polarized in said first plane,

a second laser providing laser radiation polarized in said second plane,

means for selectively deflecting said laser radiation from said first and second lasers and directing said deflected radiation into said polarizer cube in a direction substantially perpendicular to said projection axis,

said laser radiation polarized in said first plane being deflected by said polarizer cube to said recording medium to record an image therein,

said laser radiation polarized in said second plane being transmitted thru said polarizer cube,

polarizing and reflecting means interposed in the path of said radiation polarized in said second plane and transmitted through said polarizer cube for causing the polarization of said transmitted laser radiation to be polarized in said first plane and reflecting said transmitted radiation back into said polarizer cube,

said radiation polarized in said second plane and reflected back through said polarizer cube being reflected by said polarizer cube to pass through said projection lens along said projection axis,

a source of illumination radiation polarized in said second plane located behind said recording medium for projecting said images recorded on said recording medium through said polarizer cube and said projection lens along said projection axis.

4,125,844

MAGNETIC POSITION MARKER FOR A TAPE RECORDER USING MAGNETICALLY ALIGNABLE PARTICLES FOR MAKING THE MARK

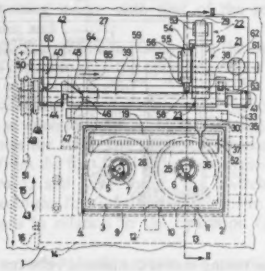
Hermann Bretschneider, Vienna, Austria; Herman P. Hueber, Eindhoven, Netherlands; Friedrich Louzil, Vienna, Austria; Karl Fischer, Vienna, Austria; Lothar Jäger, Vienna, Austria, and Johann Sagan, Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 755,431, Dec. 29, 1976. This application Jan. 23, 1978, Ser. No. 871,433

Claims priority, application Austria, Jan. 15, 1976, 24976/76

Int. Cl.[2] G03G *19/00*; G11B *5/02*

U.S. Cl. 346—74.1 **13 Claims**



1. A magnetic tape cassette recording system, comprising

(a) a tape cassette comprising at least one wall having an exterior surface; a planar marking strip affixed to said exterior surface, said strip having at least one marking zone containing magnetically alignable particles which store visually discernible marks in response to application of a magnetic field perpendicular to said strip, said marks being magnetically erasable by application of a magnetic field parallel to the plane of the strip; at least one hub rotatably mounted in said cassette; and a length of magnetic tape wound on said hub, and

(b) a tape recorder comprising a housing having a recessed portion in which said cassette is placed, so arranged that said strip is visible; a magnetic head; means for driving said tape past said head for recording or playing back information on the tape; a marking element made of a soft magnetic material and having a free end arranged to be visible; means for moving said marking element in a given direction along the marking zone in synchronization with movement of a tape past the head, said free end oriented perpendicular to said strip; means for selectively magnetizing said marking element; and means for selectively applying a magnetic field parallel to the plane of the strip of a cassette of the type described in paragraph (a).

4,125,845

INK JET PRINT HEAD PRESSURE AND TEMPERATURE CONTROL CIRCUITS

Richard G. Stevenson, Jr., Palo Alto, Calif., assignor to Silonics, Inc., Sunnyvale, Calif.

Filed Aug. 25, 1977, Ser. No. 827,564

Int. Cl.[2] G01D *15/16*

U.S. Cl. 346—140 R **9 Claims**

1. An ink jet printer head pressure control circuit, comprising:

an ink chamber having an orifice through which ink droplets may be expelled,

means cooperatively installed in conjunction with said chamber for controllably expelling ink droplets from said chamber through said orifice,

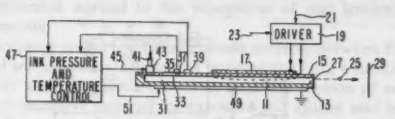
means for supplying ink to said chamber,

an electrically operated valve controlling said ink supply means between opened and closed states in response to an appropriate electrical signal,

means carried by said head for moving with respect thereto a distance proportional to the pressure of the ink within said chamber,

a first strain gauge mounted in conjunction with said head and its said pressure moving means in a manner that its electrical impedance varies in proportion to the position of said pressure moving means with respect to the head, thereby giving an electrical indication of the ink pressure within said chamber,

a second strain gauge having substantially the same characteristics as the first and positioned in a static manner on said head,



an electrical bridge having a first circuit including said first strain gauge connected between first and second junctions, a second circuit including said second strain gauge connected between second and third junctions, a third circuit including a first impedance connected between first and fourth junctions, and a fourth circuit including a second impedance connected between said third and fourth junctions,

means for providing an electrical supply voltage between said second and fourth junctions of said bridge, and

a high impedance means connected to said bridge at said first and third junctions for opening and closing said valve in accordance with a voltage difference therebetween, whereby the valve is opened and closed as appropriate to maintain the ink pressure within said chamber within a defined limit.

4,125,846

ELECTRONIC EXPOSURE CONTROL APPARATUS

Soichi Nakamoto, Machida; Fumio Ito, Yokohama; Yasuo Isobe, Kawasaki, and Tadashi Ito, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 668,720, Mar. 19, 1976, abandoned, which is a continuation of Ser. No. 446,758, Feb. 28, 1974, abandoned. This application Aug. 25, 1976, Ser. No. 717,669

Claims priority, application Japan, Mar. 7, 1973, 48/26695; Apr. 26, 1973, 48/47902; Apr. 26, 1973, 48/47904

Int. Cl.[2] G03B *7/08*

U.S. Cl. 354—23 D **1 Claim**

1. An exposure control system for a camera comprising:

(a) a first circuit for converting the intensity of light into a first analogue signal proportional to the logarithm of said intensity;

(b) analogue-to-digital conversion means, having an output terminal, connected to said first circuit for generating a number of pulses corresponding to the first analogue signal from said first circuit;

(c) a plurality of AND circuits, each having input terminals and an output terminal, the output terminal of said analogue-to-digital conversion means being connected to at least one of the input terminals of the AND circuits;

(d) a plurality of flip-flop circuits connectable at their set input terminal to the output terminal of each of said AND circuits, an output terminal of each flip-flop circuit being connectable to an input terminal of the AND circuit which is connected to the next-stage flip-flop circuit;

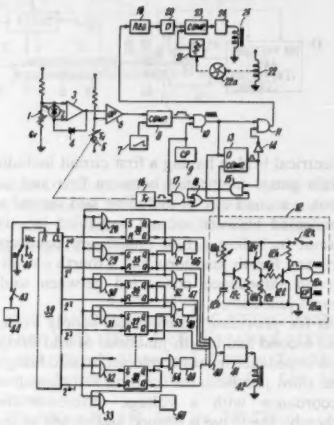
(e) a pulse generating means;

(f) a binary counter having a plural number of bits and connected to the output of said pulse generating means, said

binary counter for counting a number of pulses from said pulse generating means in association with shutter release, the output of said binary counter resetting the flip-flop circuits after said circuit had been set corresponding to the number of pulses from said analogue-to-digital conversion means;

(g) a comparison means for comparing the outputs of the plurality of the flip-flop circuits with the reset values and generating a control signal when the outputs of the plurality of the flip-flop circuits and the reset values have come into a predetermined relationship;

(h) exposure control means for controlling exposure of film in the camera in response to the control signal from the comparison means;



(i) a limit-diaphragm-value signal generating means which generates a number of pulses corresponding to the limit diaphragm value of the camera;

(j) second comparison means which compares the output pulse number of the limit-diaphragm-value signal generating means with the output pulse number of the analogue-to-digital conversion means, said second comparison means generating a second control signal when the output pulse number of the analogue-to-digital conversion means is greater; and

(k) gate means which is made operative by the output of the second comparison means and adds the difference between the two compared pulse numbers to at least one of the plurality of AND circuits.

4,125,847

RANGEFINDING MECHANISM

Masao Abe, Tokyo, Japan, assignor to Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.), Higashimurayama, Japan

Filed Oct. 3, 1977, Ser. No. 838,615

Claims priority, application Japan, Oct. 8, 1976, 51-121111

Int. Cl.[2] G03B 7/08; G01J 1/20

U.S. Cl. 354—25 **11 Claims**

1. In a camera with a focusable main lens and an automatic rangefinder therefor the latter having a photosensitive detector responsive to light from a subject received along two separate optical paths and adapted to transmit a pulse when the received light from the paths is in coincidence and to adjust the lens to focus on an image plane comprising:

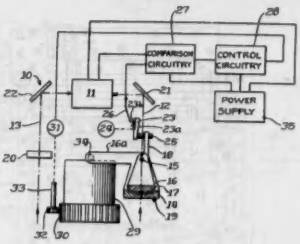
a main focusing lens for a camera mounted for fore and aft movement relative to the camera for focus adjustment,

a first optical system defining a reference path between the subject and a photosensitive detector surface having an optical axis fixed relative to said rangefinder and aimed substantially the same as the optical axis for said main focusing lens,

a second optical system for defining a path along which light may be transmitted from the subject to a photosensitive detector surface including a second optical axis movable relative to said first optical axis,

a first rangefinder objective mounted for regular periodic movement relative to said second optical system path to generate a scanned movement of said optical axis therefor,

a second rangefinder objective drivingly connected to said main focusing lens for movement across said second optical system path for deflection thereof in response to the adjusted focus position of said main focusing lens,



electronic timing means connected between said photosensitive detector surface and said periodically moving first objective for measuring the time differential between said coincidence pulse received from the former and said periodic signal received from the latter, and

electronic control means connected to receive a signal relative to said measured time differential and having a power driven member responsive thereto for moving said focusing lens in accordance with said amount of measured differential to thereby adjust the focus position of said focusing lens.

4,125,848

EXPOSURE CONTROL DEVICE FOR A SINGLE LENS REFLEX CAMERA

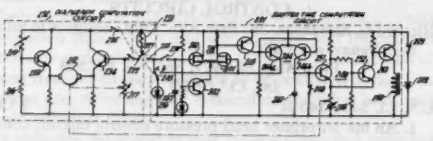
Tadashi Ito; Fumio Ito, both of Yokohama; Soichi Nakamoto, Machida, and Yasuo Isobe, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 527,016, Nov. 25, 1974, Pat. No. 4,052,727, which is a continuation of Ser. No. 455,536, Mar. 28, 1974, abandoned. This application Apr. 15, 1977, Ser. No. 787,793

Claims priority, application Japan, Mar. 30, 1973, 48-36287; Apr. 28, 1973, 48-48672; May 14, 1973, 48-53296; May 17, 1973, 48-54997; May 17, 1973, 48-54999; May 22, 1973, 48-57332; May 17, 1973, 48-54998

Int. Cl.[2] G03B 7/08

U.S. Cl. 354—29 **7 Claims**



1. An exposure control system for a single lens reflex camera comprising:

a diaphragm device having a diaphragm and aperture presetting means;

adjustment means for adjusting an aperture value preset by the aperture presetting means, the adjustment means operating in response to a shutter release operation;

first level setting means which is set at a value corresponding to the degree of adjustment made by the adjustment means;

shutter time setting means which permits manual setting of shutter time to a desired value;

light receiving means for receiving a light passed through a photographing lens when it is fully open, the light receiving means converting the light passed through the full open photographing lens into an electrical signal;

storage means which memorizes the electrical signal produced by the light receiving means;

second level setting means which is set at a value corresponding to a value memorized by the storage means and to a value set by the shutter time setting means;

comparison means which compares the output level of the first level setting means with that of the second level setting means; and

lock means which operates in response to the output of the comparison means to stop the operation of the adjustment means; and also including:

shutter control means which defines shutter time in accordance with a value memorized by the storage means;

switching means for switching the connection of said storage means from the first level setting means to the shutter control means, and vice versa, the switching means switching from the first level setting means to the shutter control means in relation to the operation of said lock means;

photographing mode selection means for selection between a shutter preference mode and an aperture preference mode, the mode selection means performing the switching operation of said switching means in such a manner that said storage means is switched to the first level setting means in the case of the shutter preference mode and to the shutter control means in the case of the aperture preference mode; and

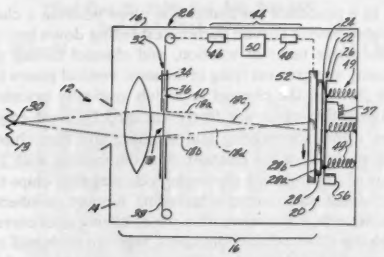
aperture setting means which permits manual setting of the aperture to define the degree of adjustment by said adjustment means in accordance with a value set by the aperture setting means.

4,125,849

THREE DIMENSION CAMERA HAVING A FILM HOLDER

Chi Y. Law, 7845 Cambie St., Vancouver, B.C., Canada (V6P 3J1)

Filed Feb. 3, 1977, Ser. No. 765,228
Int. Cl.[2] G03B *35/00*
U.S. Cl. 354—112 **8 Claims**



5. A photographic camera for three dimension photography comprising:

a housing having an opening to the interior for light rays;

means for locating photosensitive material in communication with the interior of the housing at a location during a time for exposure;

optical means in said housing for projecting light rays, which are received through said opening from a scene to be photographed, along an optical path to said location, said path having a first position therealong, the optical means comprising

a lenticular screen extending across said path at a second position farther along said path from the first position and having, on one side, a plurality of elongated lenticular elements which face in the direction from which the light rays are being projected and having an opposite side facing and positioned for contact

with the surface of such located photosensitive material;

means for blocking the received light rays at said first position;

an aperture movable transversely across said optical path at said first position for exposing said light rays sequentially to the photosensitive material moving across said screen in a direction normal to the elongation of said lenticular elements;

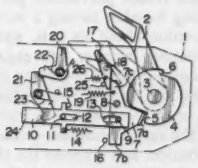
said locating means comprising means actuable between first and second positions, the first position applying a substantially uniform pressure over at least the portion of said photosensitive material for exposure and against said lenticular screen for maintaining uniform contact therebetween, and the second position being displaced in a direction away from said lenticular screen, a stop for engagement by said actuable means to prevent movement thereof in the direction of movement of said screen due to the movement of said screen, and means for urging said actuable means against said stop.

4,125,850

CAMERA ATTACHED WITH DEVICE FOR PREVENTING ERRONEOUS ACTIONS WHEN THE CAMERA IS NOT IN USE

Masami Fujita, and Hirokazu Gunshi, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Nihonbashi, Japan

Filed Mar. 14, 1977, Ser. No. 777,228
Claims priority, application Japan, Mar. 13, 1976, 51-30181[U]; Mar. 13, 1976, 51-30182[U]
Int. Cl.[2] G03B *17/42*
U.S. Cl. 354—204 **1 Claim**



1. A camera having a housing, a film transport handle mounted to said housing for oscillatory movement from a retracting position through a wind-starting position to a wind-completing position through which the transportation of one frame of the film can be effected by one complete oscillatory motion, a shutter release lever carried by said housing for axial movement along its longitudinal axis for actuating the camera shutter device, an electric device operated by said shutter device, said camera further comprising a winding stopper integral with said film transport handle and rotatable therewith and having a notch at a position corresponding to the wind-starting position of the film transport handle, a control board integral with the film transport handle and rotatable therewith, first spring means for biasing said control board to rotate along with said handle and said stopper in a direction towards said retracting position and having a return prevention portion for preventing rotation of said control board by said first spring means at the wind-starting position of the film transport handle and also having a cam portion for controlling the opening and closing of the electric source circuit of said electric device, a locking member rotatably mounted to said housing and having

a first arm, a second arm, a third arm and an engagement pin, a second spring means for biasing said locking member so as to cause said first arm to engage said winding stopper notch to block the rotation of the film transport handle in a direction towards said wind-completion position and with said second arm being displaced from a position in alignment with said shutter release lever, thereby permitting axial movement of said shutter release lever, a safety member pivotably mounted to one side of said locking member, a third spring means for biasing said safety member into contact with said third arm for displacing said second arm to a position blocking said shutter release lever and preventing axial movement thereof, said safety member being rotatable against its spring bias by the film transport handle when said handle is moved to retracting position to cause rotation of said locking member against the bias of said second spring means, a longitudinally movable transmitting member including an engagement slit, an engagement pin carried by said locking member and received within said engagement slit, fourth spring means for biasing said transmitting member in a direction tending to maintain said locking member first arm within said winding stopper notch, said transmitting member being mounted to said camera housing such that when the shutter device comes into operation by the depression of the shutter release lever axially, said transmitting member is displaced against the bias of the fourth spring means to cause the engagement slit to engage the engagement pin to rotate the locking member in opposition to its spring bias to release said first arm from said notch of said stopper, and that when the film transport is completed by the rotation of the film transport handle, said transmitting member is displaced in the opposite direction by the biasing force of said fourth means to release said engagement pin; a control board mounted to said handle for rotation therewith, a control board stopper member having a preventive portion and being pivotably mounted adjacent said control board, fifth spring means for biasing said control board stopper member to a position such that the preventive portion engages the return preventive portion of said control board to prevent the film transport handle from returning to retracting position, a push button carried by said control board stopper member and depressible for rotating said control board stopper member against its bias to thereby disengage the preventive portion of said control board stopper member from the return prevention portion of said control board, a switching member having a movable terminal being mounted for rotation about its axis, sixth spring means for biasing said switching member into engagement with a cam portion of said control board and being rotatable by said cam portion such that the electric source current of the electric device may be open when the film transport handle is in a position within the range from said retracting position to said wind-starting position, and wherein the electric source circuit may be closed when the film transport handle remains within the range from the wind-starting position to the wind-completing position, such that double film exposure is precluded by prevention of consecutive axial movements of said shutter release lever except upon movement of the film one frame position by complete oscillatory rotation of the film transport handle, and wherein consecutive oscillatirns of the film transport handle to effect double wind-completing operation is prevented absent operation of the shutter device.

4,125,851

PHOTOGRAPHIC FILM PROCESSOR

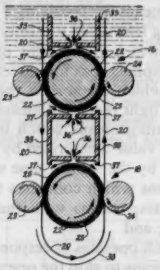
Vivian D. Krehbiel, 715 E. 10th St., Wichita, Kans. 67214

Continuation of Ser. No. 113,148, Feb. 8, 1971, abandoned. This application Jun. 28, 1976, Ser. No. 700,404

Int. Cl.[2] G03D *3/08*

U.S. Cl. 354—321 **1 Claim**

1. An apparatus for transporting photographic film in a chemical solution comprising a pair of parallel spaced rollers in contacting relation, at least one of said rollers including a cylindrical member having concentric circular cavities in each end thereof, a plug means for insertion into each of said end cavities and having circular portions with a diameter less than the diameter of said end cavities, and a tubular-shaped stocking member surrounding said cylindrical member with its free ends releasably held in said end cavities by said plug means and said



rollers being rigidly positioned such that said stocking covered roller is depressed along its line of contact with its companion roller to cause a scrubbing action to take place on said film passing between said rollers.

4,125,852

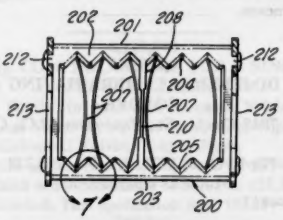
DENTAL FILM CARRIAGE

Louis E. Brooks, 14 Lawson La., Great Neck, N.Y. 11023

Filed May 31, 1977, Ser. No. 802,274

Int. Cl.[2] G03D *3/10*

U.S. Cl. 354—322 **14 Claims**

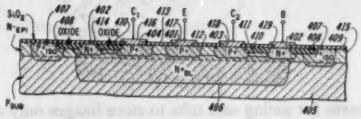


1. In a processor for dental film chips wherein a channel is provided having curved portions extending down into and out of successive tanks of solution, said channel having pairs of opposing vee-grooves lying in the same vertical planes forming paths through the channel in which vertically oriented standard size film chips are freely engaged by their edges, and lifting means for moving said standard size film chips along rising portions of the channel, the combination with the processor of carriages for conveying odd-size film chips through the channel, said carriages including support members in the form of vertically oriented thin plates having sizes corresponding to the standard size film chips, wherein each said carriage is formed of a single one of said support members having a rectangular opening in the central portion thereof of a size to enable an odd size film chip bowed along one dimension thereof to be inserted so as to extend transversely of the support member with the opposite side edges engaging diagonally opposite corners thereof, whereby said carriages can be introduced into said channel with their support members freely engaged by pairs of opposing vee-grooves and can be moved by said lifting means along said channel in the same manner as said standard film chips.

4,125,853
INTEGRATED CIRCUIT TRANSISTOR

Alan W. Fulton, Batavia; William J. Ooms, Schaumburg, and Ray A. Reed, Bolingbrook, all of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 28, 1977, Ser. No. 781,788
Int. Cl.[2] H01L 29/72
U.S. Cl. 357—36 4 Claims



1. A semiconductor structure comprising a bulk region which is largely of one conductivity type; a relatively lightly doped first region of largely the opposite conductivity type overlying said bulk region;

a relatively heavily doped buried tub of said opposite conductivity type vertically interposed between said bulk region and said first region;

a relatively heavily doped frame shaped base contact region of said opposite conductivity type extending from the exposed surface of said first region to said buried tub region to provide electrical access to said buried tub;

a relatively heavily doped frame shaped isolation region of said one conductivity type spaced apart from said base contact region and extending from the exposed surface of said first region to said bulk region outside of said buried tub;

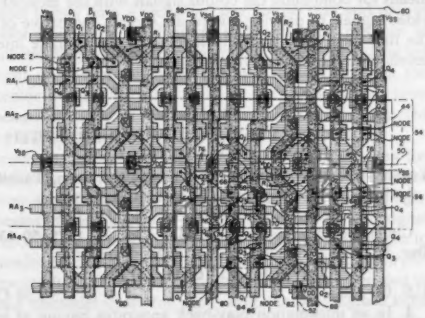
a plurality of relatively heavily doped spaced apart emitter/-collector regions of said one conductivity type encircled by said base contact region and extending from the exposed surface of said first region to said buried tub; oxide regions extending from the exposed surface of said first region towards said bulk region interposed laterally between said isolation region and said base contact region region and between said base contact region and said emitter/collector regions;

and means for electrically connecting individually to said base contact region, and said electrode regions.

4,125,854
SYMMETRICAL CELL LAYOUT FOR STATIC RAM

Vernon G. McKenny, and Tsiu C. Chan, both of Carrollton, Tex., assignors to Mostek Corporation, Carrollton, Tex.

Filed Dec. 2, 1976, Ser. No. 746,665
Int. Cl.[2] H01L 27/02
U.S. Cl. 357—41 11 Claims



1. An integrated circuit memory comprising:

a substrate of semiconductor material of a first conductivity type;

an array of memory cells fabricated on the substrate in rows and columns;

each cell of the array including first and second data storage transistors, first and second enabling transistors, and first and second impedance devices, each of the transistors having a gate, a source diffusion region, and a drain diffusion region formed in the substrate;

the gate of the second data storage transistor being electrically connected to the drain diffusion of the first data storage transistor, to the drain diffusion of the first enabling transistor, and to the first impedance device thereby defining a first data node in each cell of the array;

the gate of the first data storage transistor being electrically connected to the drain diffusion of the second data storage transistor, to the drain diffusion of the second enabling transistor, and to the second impedance device thereby defining a second data node in each cell of the array;

the drain diffusion of the first data storage transistor being formed in common with the drain diffusion of the first enabling transistor of each cell of the array;

the array including a first group of four of the cells disposed in mutual contiguous relation to each other in a first row and in a second row adjacent to the first row, and in a first column and in a second column adjacent to the first column,

the source diffusions of the second data storage transistors of contiguous cells in the first and second rows of the first group being formed in common, respectively; and,

the first and second impedance devices of each cell of the first group being electrically connected together to form a drain supply node common to each cell of the group.

4,125,855
INTEGRATED SEMICONDUCTOR CROSSPOINT ARRANGEMENT

James A. Davis, Glen Ellyn, and William J. Ooms, Schaumburg, both of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 28, 1977, Ser. No. 781,790
Int. Cl.[2] H01L 27/04
U.S. Cl. 357—45 5 Claims

1. A semiconductor structure formed in a body comprising a substrate of one conductivity type and a relatively lightly doped epitaxial layer of the opposite conductivity type formed thereon, the structure comprising:

a relatively highly doped buried tub of said opposite conductivity type formed in said substrate, a relatively highly doped first frame shaped isolation region of said opposite conductivity type extending from the exposed surface of said epitaxial layer to said buried tub, a relatively highly doped second frame shaped isolation region of said one conductivity type spaced apart from and encircling said first frame shaped region and extending from said exposed surface of said epitaxial layer substantially to said substrate outside of said buried tub;

at least one pair of relatively highly doped, equal sized, stripe shaped electrode regions of said one conductivity type overlying said buried tub, whereby said electrode regions extend from said exposed surface of said epitaxial layer to said buried tub;

means at the exposed surface of said epitaxial layer for electrically connecting individually to the electrode regions of each of said pairs and means for electrically interconnect-

ing corresponding electrodes of said pairs to one and another; and

a control region of said one conductivity type shallower than said second isolation region formed laterally outside said first frame shaped isolation region but overlying said buried tub, a source region of said opposite conductivity type formed within said control region,

means at the exposed surface of said control region for providing electrical access thereto, and means at the exposed surface of said source region for electrically contacting thereto.

4,125,856

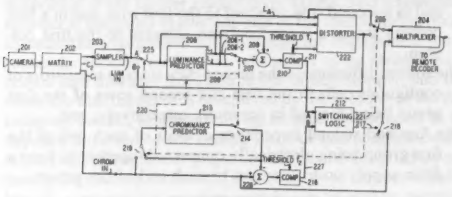
DIGITAL ENCODING AND DECODING OF COLOR VIDEO SIGNALS

Arun N. Netravali, Matawan, and Charles B. Rubinstein, Colts Neck, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 19, 1977, Ser. No. 826,057

Int. Cl.[2] H04N *9/32*

U.S. Cl. 358—13 **10 Claims**



1. Apparatus for encoding a sampled video signal for transmission to a remote location, said video signal including a luminance component and a corresponding color component, comprising:

means for computing at least two predictions of the luminance value of a present sample of said signal by forming at least two weighted sums of previous samples' luminance values, each of said weighted sums having an associated prediction error, an optimum one of said weighted sums being associated with the smallest of said prediction errors; and

multiplexing means for transmitting an encoded signal to said remote location, said multiplexing means including

(a) means for encoding the luminance value of said present sample, and

(b) means for encoding the color value of said present sample if said smallest prediction error exceeds a first threshold value.

4,125,857

FIELD SEQUENTIAL COLOR TELEVISION CAMERA ARRANGEMENTS

Alan E. Sarson, and William J. R. Clark, both of Great Baddow, England, assignors to Elliott Brothers (London) Limited, Chelmsford, England

Filed Apr. 8, 1977, Ser. No. 785,782

Claims priority, application United Kingdom, Apr. 8, 1976, 14210/76

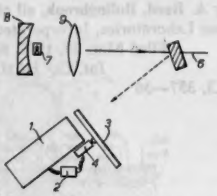
Int. Cl.[2] H04N *9/07*

U.S. Cl. 358—42 **13 Claims**

13. A field sequential color television camera arrangement comprising, in combination:

an image isocon camera tube having a face plate and a photo-cathode having an active area of predetermined size;

means sequentially interposing different color filters between said face plate and a viewed scene whereby periodically and for time periods each of which is a fraction only of a field period of the tube, a different sequential one of said color filters is located relative to said active area of the photo-cathode as to image said scene thereon solely through such filter; and



means for gating said tube to store images only during said time periods.

4,125,858

VIDEO DISPLAY ARRANGEMENTS

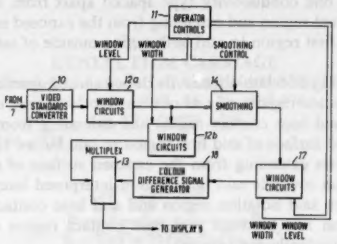
Godfrey N. Hounsfield, Newark, and Donald F. McLean, Isleworth, both of England, assignors to EMI Limited, Hayes, United Kingdom

Filed Mar. 25, 1977, Ser. No. 781,411

Claims priority, application United Kingdom, Mar. 27, 1976, 12420/76

Int. Cl.[2] A61B *6/00*; H04N *7/18, 9/535*

U.S. Cl. 358—82 **10 Claims**



1. A video display arrangement for processing monochrome video signals, derived from a medical examination apparatus, representing, by intensity levels of individual elements of a matrix of elements in a picture to be displayed, values of a measured quantity in a corresponding matrix of elemental areas of a region of the body of a patient, the arrangement including means for smoothing said signals to provide further signals indicative of average intensity levels for groups of said elements, means for deriving, from said further signals, colour signals having hues related to said average intensity levels and means for combining the colour signals with the monochrome video signals to provide composite signals, indicative of both the first mentioned intensity levels and the average intensity levels, for a colour television display.

4,125,859

VIDEODISC PLAY-BACK APPARATUS WITH VARIABLE WIDTH BEAM

Yoshitada Oshida, Sayama, and Susumu Sawano, Tachikawa, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 1, 1976, Ser. No. 737,329

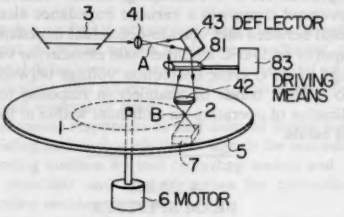
Claims priority, application Japan, Oct. 31, 1975, 50-130464; Dec. 5, 1975, 50-143993; Dec. 5, 1975, 50-143994

Int. Cl.[2] G11B *7/12*

U.S. Cl. 358—128 **24 Claims**

1. In an information play-back apparatus having at least a light source producing a light beam, a disc-shaped information recorded medium, and optical means for guiding said light beam along a path from said light source to an information

recorded track on said information recorded medium, the improvement comprising means disposed in the optical path of said light beam to said information recorded track for controlling the pattern of said light beam impinging on said information recorded track on said information recorded medium.



4,125,860

REPRODUCER FOR AN ERASEABLE VIDEODISC

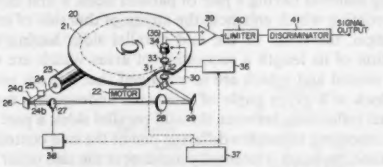
Akira Ishii, Kawasaki; Fumio Kishino, Tokorozawa, and Kingo Yamagishi, Kokubunji, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Jun. 8, 1976, Ser. No. 693,778

Claims priority, application Japan, Jun. 16, 1975, 50-72856; Oct. 22, 1975, 50-127032

Int. Cl.[2] H04N *5/76*

U.S. Cl. 358—128 **14 Claims**



1. Apparatus for reproducing electric signals recorded in a moving recording medium of low diffraction capability as optical phase changes by the use of a carrier modulation method, comprising:

a laser light source for emitting a laser beam;

dividing means for dividing said laser beam into a pair of spaced apart laser beams;

condensing means for condensing said pair of spaced apart laser beams onto a recording medium so that said pair of laser beams are incident on said recording medium at substantially the same point and so that non-diffracted light of one of said laser beams is passed through the center of the diffracted light of the other of said laser beams, the light of said other laser beam being diffracted by said signal recording medium; and

reproducing means including a pair of photodetectors for receiving respectively a pair of overlapped light beams from said recording medium, each pair of overlapped light beams including a beam of light diffracted by said signal recording medium and a beam of non-diffracted light to produce a beat signal between said diffracted and non-diffracted light beams; and a differential amplifier coupled to said photodetectors for subjecting the beat signals from said photodetectors to differential amplification, thereby reproducing at the output of the differential amplifier a modulated signal from said beat signals.

4,125,861

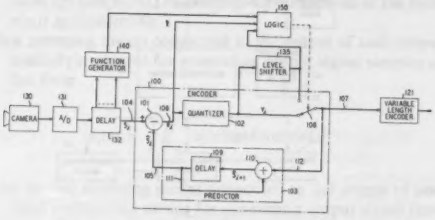
VIDEO SIGNAL ENCODING

Frank W. Mounts, Colts Neck; Arun N. Netravali, Matawan, both of N.J., and Birendra Prasada, Nun's Island, Canada, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 18, 1977, Ser. No. 825,777

Int. Cl.[2] H04N *7/12*

U.S. Cl. 358—133 **20 Claims**



1. Apparatus for encoding a series of samples of a video signal representing an image, including,

(I) a DPCM encoder arranged to receive said samples, including

(A) means for predicting the value of each of said samples based upon previous outputs from said encoder, and

(B) means for encoding an error signal indicative of the difference between each of said samples and the predicted version thereof, said encoding means including

(1) a terminal forming the output of said encoder and the input to said predicting means,

(2) a quantizer adapted to generate a first signal having a first representative level selected from along a plurality of predefined levels in response to said error signal falling within one of a corresponding plurality of predefined decision ranges, and

(3) means for generating a second signal having a second representative level selected from among said same plurality of predefined levels in response to said first signal, and

(II) means for coupling said first or said second signal to said terminal, and

(III) means for controlling said coupling means as a function of the relative magnitude of a first threshold value indicative of the spatial activity of said video signal and a quantization error signal indicative of the difference between said second signal and said error signal.

4,125,862

ASPECT RATIO AND SCAN CONVERTER SYSTEM

Paul S. Catano, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 31, 1977, Ser. No. 783,134

Int. Cl.[2] H04N *5/02*

U.S. Cl. 358—140 **9 Claims**

1. An aspect ratio and scan converter system for use with signal information developed from optical scanning of a rectangular field of view at a high scan speed along the minor axis relative to low scan speed along the major axis of the field of view comprising:

an analog-to-digital converter connected to receive said signal information for developing commensurate digital signals;

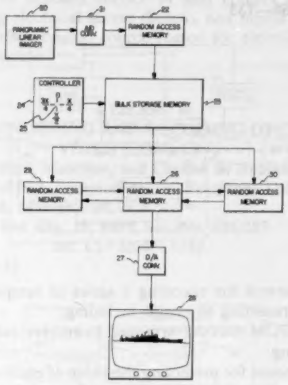
a bulk storage memory for serially storing the sequences of digital signals developed from high speed optical scanning along said minor axis and representing said entire rectangular field of view;

means for addressing said bulk storage memory for reading out selected sequences of digital signals serially stored

therein representing a selected portion of said field of view;

a random access memory for receiving and storing each of said selected sequences of digital signals in a first direction of a two-dimensional format;

means for addressing said random access memory to read out the stored selected sequences of digital signals by



repetitive scan in the second direction of said two-dimensional format;

a digital-to-analog converter for receiving the digital output of said random access memory and developing commensurate analog signals; and

display means responsive to said analog signals for producing a raster format of the visual information contained in said selected portion of said field of view.

4,125,863

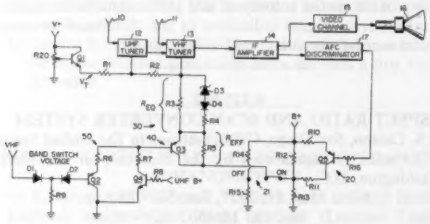
AFC WAVESHAPING CIRCUIT

Rangaswamy Arumugham, Batavia, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sep. 9, 1977, Ser. No. 832,005

Int. Cl.[2] H04N *5/50;* **H04B** *1/16*

U.S. Cl. 358—195 **15 Claims**



1. In a television receiver including a radio frequency tuner comprising a UHF tuner and a VHF tuner with respective UHF and VHF tuning control terminals for the application of respective control voltages for establishing the frequency of operation of said tuners, said receiver further including an automatic frequency control system having an AFC amplifier for developing an AFC voltage for effecting an AFC error correction voltage at said tuning control terminals in order to compensate for errors in the frequency of operation of said tuners, a source of tuning voltage coupled to said UHF tuning control terminal through a series-connected first resistance and to said VHF tuning control terminal through a series-connected second resistance, and a voltage-dependent impedance connected to said second resistance, said impedance comprising the parallel combination of a resistor and a nonlinear conduction device for developing a range of AFC error correction voltage which is a function of said tuning voltage,

an improved AFC waveshaping circuit wherein the improvement comprises a variable impedance element connected between said voltage-dependent impedance and an output of said AFC amplifier, said element for varying the range of AFC error correction voltage between at least two distinct bands of channels in response to a signal indicative of operation on a channel within at least one of said bands.

4,125,864

BEAM SPLITTER

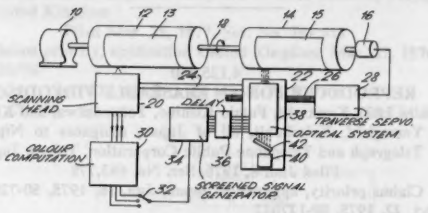
John E. Aughton, London, England, assignor to Crosfield Electronics Limited, London, England

Filed Mar. 1, 1977, Ser. No. 773,212

Claims priority, application United Kingdom, Mar. 3, 1976, 8517/76

Int. Cl.[2] H04N *5/86;* **G03B** *27/78;* **G02B** *5/04;* **G03B** *21/14*

U.S. Cl. 358—298 **6 Claims**



1. A beam splitter comprising a single block of light-transmitting material having a pair of parallel sides, a first of which has a coating which enhances the ability of that side of internal reflection, the other of the said parallel sides having in the direction of its length a succession of areas which are differently coated and which are so arranged that a beam entering the block at a given angle of incidence undergoes a series of internal reflections between the said parallel sides, a part of the beam emerging through a different one of the said coated areas each time the beam is internally incident at the said other of the parallel sides and the remaining part of the beam being thereafter at least partially reflected from the first side to the next coated area of the said other of the parallel sides.

4,125,865

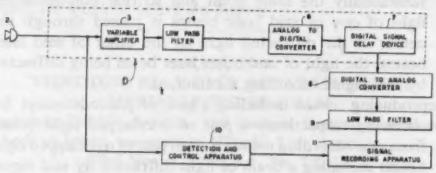
RECORDING SYSTEM

Said Mohammadioun, Atlanta, Ga., assignor to Lanier Business Products, Inc., Atlanta, Ga.

Filed Jan. 3, 1977, Ser. No. 756,386

Int. Cl.[2] G11B *5/00, 15/18*

U.S. Cl. 360—32 **14 Claims**



1. A recording system having a recording means for recording analog electrical signals on a recording medium when said recording means is in a recording mode of operation, and a means for introducing input electrical signals into said system and for processing said input electrical signals to provide said analog electrical signals for recording on said recording me-

dium by said recording means, wherein the improvement comprises:

a first means responsive to said input electrical signals for providing delayed digital signals, said first means comprising

an analog to digital conversion means for converting said input electrical signals to digital signals, and a digital signal delay means, responsive to said digital signals, for providing said delayed digital signals after a predetermined interval of time;

a second means responsive to said delayed digital signals for providing said analog electrical signals for recording on a recording medium by said recording means; and

digital detection and control means for controlling said recording means comprising

a digital magnitude comparison means for providing a discrete output in response to each of said digital signals having a magnitude greater than a predetermined magnitude,

a first counting means, responsive to a predetermined number of said discrete outputs, for providing a control output,

a second counting means, responsive to the absence of said discrete outputs for a predetermined interval of time, for terminating said control output, and

a control means, responsive to said control output of said first counting means, for causing said recording means to be in said recording mode of operation.

4,125,866
NON-RECURSIVE DISCRETE FILTER

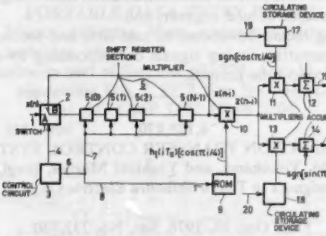
Hendrik A. van Essen, and Petrus J. van Gerwen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 16, 1977, Ser. No. 807,168

Claims priority, application Netherlands, Jul. 6, 1976, 7607426

Int. Cl.² G06F *15/34*

U.S. Cl. 364—724 **1 Claim**



1. A non-recursive discrete filter for processing input signal samples $x(m)$ to generate output signal samples $y(n)$ occurring at a predetermined output sampling frequency f_s, said discrete filter having a transfer characteristic with a center frequency f_o, where $f_s = 8f_o$, said transfer characteristic being related to the transfer characteristic of a predetermined lowpass filter with an impulse response $h_1(i)$, said discrete filter comprising

input means for receiving said input signal samples $x(m)$;

first storage means for storing and supplying a given number of input signal samples $x(m)$;

second storage means for storing and supplying filter coefficients $a(i)$, where:

$$a(i) = h_1(i) \cdot \frac{1}{2}\sqrt{2} \qquad \text{for } i = \text{odd}$$

$$a(i) = h_1(i) \qquad \text{for } i = \text{even};$$

first multiplying means for modifying each input signal sample from said first storage means by a corresponding filter coefficient from said second storage means to generate modified input signal samples $z(n,i) = a(i)x(n-i)$;

second multiplying means for modifying the modified signal samples $z(n,i)$ from said first multiplying means by a coefficient $sgn\{\cos(\pi i/4)\}$ to generate signal samples of the form $z(n,i)\ sgn\{\cos(\pi i/4)\}$;

third multiplying means for modifying the modified signal sampls $z(n,i)$ from said first multiplying means by a coefficient $sgn\{\sin(\pi i/4)\}$ to generate signal samples of the form $z(n,i)\ sgn\{\sin(\pi i/4);$

first summing means connected to the output of said second multiplying means for generating output signal samples of the form

$$y_1(n) = \sum_{i=0}^{N-1} z(n,i)\text{sgn}\{\cos(\pi i/4)\};$$

and second summing means connected to the output of said third multiplying means for generating output signal samples of the form

$$y_2(n) = \sum_{i=0}^{N-1} z(n,i)\text{sgn}\{\sin(\pi i/4)\}.$$

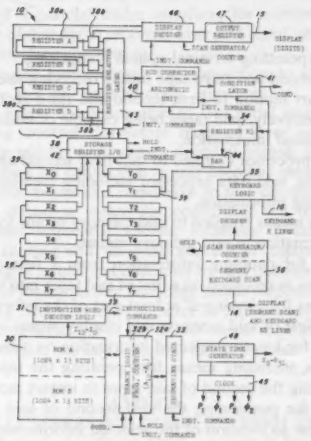
4,125,867
ELECTRONIC CALCULATOR OR MICROPROCESSOR HAVING A HEXADECIMAL/BINARY CODED DECIMAL ARITHMETIC UNIT

Michael J. Cochran, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 27, 1976, Ser. No. 736,005

Int. Cl.² G06F *7/50*

U.S. Cl. 364—772 **8 Claims**



1. In an electronic calculator system having an input means for receiving numeric data and function command, an instruction word memory for storing a number of instruction words and addressable in response to the function commands received by said input means, an instruction word decoder means for decoding instruction words outputted from said instruction word memory, and an arithmetic unit for performing arithmetic operations on numeric data received by said input means, said arithmetic unit comprising:

(a) an adder having two inputs and an output, the adder performing binary arithmetic operations on data received at the inputs thereof and communicating the results of such binary arithmetic operations to the output thereof,

(b) a latch circuit settable and resettable by said instruction word decoder means,

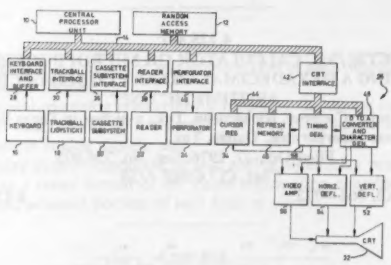
(c) a binary coded decimal format corrector circuit connected at the output of said adder, said binary coded decimal format corrector circuit including means for adding the number "six" to each four bit digit of such results which is greater than a hexadecimal "nine", said adding means being selectively enabled and disabled by said latch circuit.

4,125,868

TYPESETTING TERMINAL APPARATUS HAVING SEARCHING AND MERGING FEATURES

John F. Hruby, Woodinville; Rex McCleary; Jerome M. O'Hogan, both of Redmond, and Nathan H. Searle, Woodinville, all of Wash., assignors to Automix Keyboards, Inc., Redmond, Wash.

Filed Oct. 28, 1975, Ser. No. 626,075
Int. Cl.[2] G06F *7/36, 7/28, 15/40;* G11B *27/02*
U.S. Cl. 364—900 **16 Claims**



1. A typesetting terminal system comprising:

first, second and third tape means receiving and adapted to impart motion to first, second and third recording tapes respectively, said tapes being capable of bearing digitally recorded information,

a data processor coupled to said first, second and third tape means, said data processor including memory means for storing information,

display means coupled to said memory means for displaying information in said memory means,

means for coupling information from a first of said tape means as recorded on a first of said tapes into said memory means for viewing of at least part of the information from the first of said tapes on said display means,

means for locating selected information on a second of said tapes, including means for operating the tape means receiving the second of said tapes to impart motion thereto and for positioning the said second of said tapes in response to location of the selected information,

means for coupling located information from the said second of said tapes into said memory means for simultaneous viewing in combination with information present on said display means from said first of said tapes,

manually operable means for adjusting information in said memory means with said data processor for attaining a desired presentation on said display means including the combination of information from the first and second tapes at an operator controlled cursor location in information from the first tape for said simultaneous viewing,

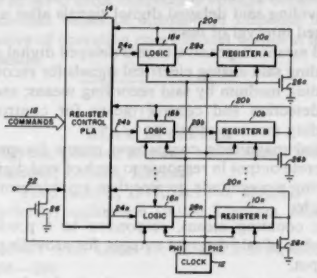
and means for outputting combined information from said memory means to a third of said tape means for recording on a third of said tapes.

4,125,869

INTERCONNECT LOGIC

Manfred Gutmann, Cupertino, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 11, 1975, Ser. No. 595,116
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—900 **14 Claims**



1. An interconnect circuit for supplying data to a register comprising

(a) first means responsive to at least one command and to input data from external sources connected to respective inputs to said first means for supplying said command and simultaneously inhibiting said input data during a first time period and supplying said input data during a second time period at an output of said first means upon the condition that said one command is present during said first time period,

(b) second means connected to said output for supplying said input data during said second time period to an input of said register upon the condition that said one command is present during said first time period and for supplying recirculation data to an input of said register, upon the condition that said one command is not present during said first time period, said recirculation data being derived at an output of said register; and

(c) timing means connected to said first and second means for generating timing signals corresponding to said first and second time periods.

4,125,870

INFORMATION TRANSFER CONTROL SYSTEM

Seigo Suzuki, Yokohama, and Yoshiaki Moriya, Inagi, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Oct. 15, 1976, Ser. No. 732,730
Claims priority, application Japan, Oct. 15, 1975, 50-124139
Int. Cl.[2] G11C *7/00, 8/00*
U.S. Cl. 364—900 **2 Claims**

1. An information transfer control system for controlling the transfer of information in one direction or the other between a data processor and an input/output device; the data processor producing a count-up control signal and a count-down control signal depending upon the direction of desired information transfer and the data processor further producing a switching control signal designating that information is desired to be transferred, said control system comprising:

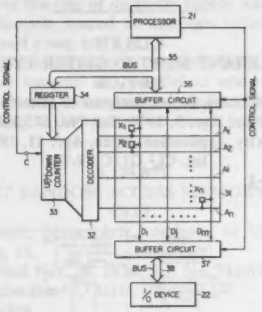
a first-in/first-out stack disposed between the data processor and the input/output device for transferring information supplied from the data processor to the input/output device and for transferring information supplied from the input/output device to the data processor and for temporarily storing said information in the stack;

an up/down counter with a preset function which executes its counting-up or counting-down operation in response to a count-up or count-down control signal applied from the data processor and in response to its counting operations

delivers an output signal for designating addresses of the stack;

an address decoder connected to the counter to decode the output signal of the counter so as to designate a unique address at said stack for each individual output signal of said counter;

register means for storing an initial address and final address located anywhere within said stack from the data processor to initially set said output signal of said counter at a



value designating said initial address and to prevent said counter from counting from said initially set value beyond a value of said output signal designating said final address; and

buffer circuit means for coupling the data processor and the stack and for coupling the stack and the input/output device in response to the direction of desired information transfer between the processor and the stack and between the stack and the input/output device upon receipt of a switching control signal applied from the processor.

4,125,871

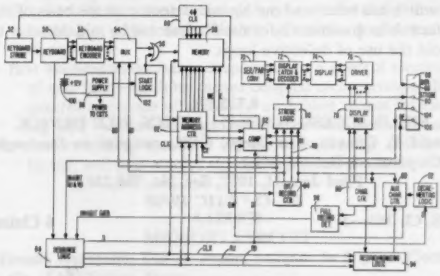
PORTABLE DATA ENTRY DEVICE

Peter G. Martin, Arlington, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 603,878, Aug. 11, 1975. This application Feb. 7, 1977, Ser. No. 766,222

Int. Cl.[2] G06F *3/02*; H03B *5/04*

U.S. Cl. 364—900 **13 Claims**



1. A portable data entry device comprising:

a housing of size and configuration for portable use;

a dynamic continuously clocked serial solid state memory within said housing, said memory having a minimum useable clock rate which is a function of operating temperature, and having input and output stages;

means on said housing for manual entry of data into said memory;

control means on said housing for manual accessing of locations within said memory for review of data previously entered in said memory locations;

a display on said housing for visual representation of data stored in said memory by said manual entry means;

means within said housing for energizing said device;

connector means on said housing for connection to a data utilization system by which data stored in said memory can be conveyed to said data utilization system; and

clock means for providing clock signals to said memory and in which the power consumption of the clock means is related to the rate of clock signals therefrom, and including temperature sensing means for sensing an operating temperature and means for varying the rate of said clock signals in accordance with sensed operating temperature to provide clock signals of said minimum rate for the sensed operating temperature thereby to provide proper memory operation at minimum power consumption.

4,125,872

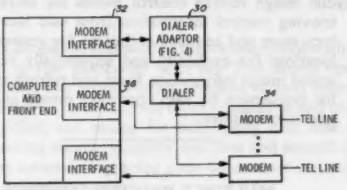
MULTILINE AUTOMATIC CALLING SYSTEM ADAPTER

Ronald K. Maxwell, Palo Alto, Calif., assignor to Racal-Vadic, Inc., Sunnyvale, Calif.

Filed Mar. 31, 1977, Ser. No. 783,144

Int. Cl.[2] G06F *7/28*

U.S. Cl. 364—900 **7 Claims**



1. In an automatic calling system for use between a serial interface and a parallel dialer interface, for controlling the transmission of dial digits received over said serial interface to said dialer interface comprising:

an addressable buffer means for connection to said serial interface and said parallel dialer interface;

decoding means for connection to said serial interface for decoding control characters received over said serial interface and for producing a decoded output; and

control means for connection to said decoding means and to said buffer means and responsive to said decoded output of said decoding means for controlling the transfer of digits into sequential address locations in said buffer means, starting with an initial address, in response to the decoding of a start text character by said decoding means,

said control means further including means responsive to the decoding of an end text character by said decoding means for reading digits out of said buffer means for transmission to said dialer, starting with said initial address.

4,125,873

DISPLAY COMPRESSED IMAGE REFRESH SYSTEM

Donald J. Chesarek, Los Gatos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1977, Ser. No. 811,213

Int. Cl.[2] G06F *3/14*

U.S. Cl. 364—900 **19 Claims**

1. A raster display device refresh system comprising:

a refresh memory store having coded image information segments representing a visual image and stored in addressible locations;

converter means for converting said coded image information into non-overlapping non-coded raster information for visual display on a raster display, said converter means including a plurality of decompressor means for decompressing said coded image information segments into non-

coded raster information and a plurality of refresh buffer means, one associated with each decompressor means for intermediate storage of said non-coded raster information for use by the raster display;

means for generating control information representative of the storage addresses and content information for each of said coded image information segments;

an increment directory storage means for storing said control information at incrementally addressible locations; and

cyclic image refresh control means for incrementally retrieving control information from said increment directory store and responsive thereto for generating address locations for cyclically and sequentially retrieving said coded image information from said refresh memory store for conversion by said converter means and display on said raster display.

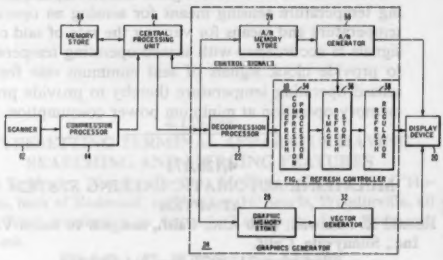


FIG. 2 REFRESH CONTROLLER

4,125,874

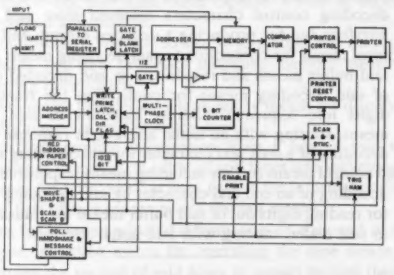
MULTIPLE PRINTER CONTROL

Carlos S. Higashide, Elk Grove Village, and Paul G. Srodes, Arlington Heights, both of Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 650,220, Jan. 19, 1976, abandoned. This application Oct. 11, 1977, Ser. No. 841,180

Int. Cl.[2] G06F *3/04, 3/12*

U.S. Cl. 364—900 **8 Claims**



1. A system for remotely controlling the printing of data at a plurality of printer locations wherein a central processing unit is connected over a serial transmission channel to a plurality of printers, said central processing unit first serially addressing all the printers selected to print the data and then serially transmitting out in one transmission the data in the form of data words on the transmission channel for printing by all the selected printers, said system comprising:

central processing means for first serially transmitting addresses associated with said selected printers and for then serially sending out in one transmission data to be printed by all said selected printers;

a plurality of printers each comprising receiving means for receiving said serially transmitted addresses, address field means for establishing a particular address for its associated printer, address matching means for providing an address match signal when there is a match between one of said addresses transmitted by said central processing means and said particular address established by said address field means, and latch means responsive to said address match signal for conditioning its associated printer to print out the data transmitted by said central processing means and for maintaining said condition even though its associated printer receives other addresses; and,

transmission channel means for connecting said central processing means to said plurality of printers.

4,125,875

FAULT TOLERANT SHIFT REGISTER TYPE MEMORY DEVICE

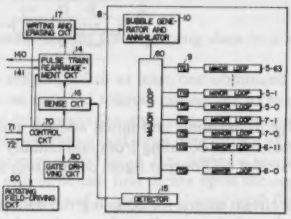
Nobuo Saito, Mitaka, Japan, assignor to Hitachi, Ltd., Japan

Filed Apr. 9, 1976, Ser. No. 675,338

Claims priority, application Japan, Apr. 11, 1975, 50-43203

Int. Cl.[2] G11C *19/08*

U.S. Cl. 365—1 **12 Claims**



1. A shift register type memory device comprising a plurality of storage loops which store data and which have at least one alternative loop to be substituted for a defective loop, means to write data into said storage loops, a defective loop address memory which is constructed on the same storage medium as that of said storage loops and which stores a defective loop address in binary expression, a common detector which detects the information of said defective loop address memory and the data of said storage loops, a common propagation circuit which propagates the data read out from said defective loop address memory and said storage loops to said detector, and control means for rearranging the order of a pulse train of the data to be written by the data writing means or which has been read out by said detector on the basis of the defective loop address information detected by said detector to avoid the use of defective loops.

4,125,876

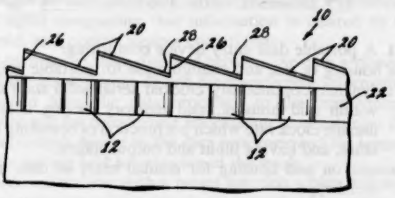
FIELD ACCESS BUBBLE LATTICE FILE DEVICE

Magid Y. Dimyan, San Diego, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jan. 31, 1977, Ser. No. 764,230

Int. Cl.[2] G11C *19/08*

U.S. Cl. 365—3 **6 Claims**



1. A bubble lattice file device for storing data by placing an

array of bubble domains of different states in a lattice at the appropriate lattice sites comprising:

an overlay of propagate elements of magnetic material positioned over a film of magnetic bubble material said propagate elements defining rows for the propagation of bubbles there along,

means adapted to space the propagate elements from the bubble material to maintain a uniform gradient between each of said propagate element and the bubble material in the direction of translation of the bubbles,

an overlay of propagate elements of magnetic material positioned over the film of magnetic bubble material defining access channels spaced at intervals between said bars defining said rows; and

means for generating periodic magnetic fields in the plane of the bubble material and parallel to said rows and said access channels and capable of magnetizing said propagate element at the appropriate timing intervals.

4,125,877

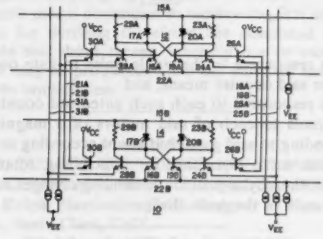
DUAL PORT RANDOM ACCESS MEMORY STORAGE CELL

John R. Reinert, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 26, 1976, Ser. No. 745,023

Int. Cl.[2] G11C *7/00, 11/40*

U.S. Cl. 365—190 **15 Claims**



1. A dual port memory cell comprising:

a first storage cell having first and second cross-coupled switching means;

first selecting means coupled to said first and second switching means for effecting selection of said first storage cell;

a second storage cell having third and fourth cross-coupled switching means;

second selection means coupled to said third and fourth switching means for effecting selection of said second storage cell;

first unidirectional means responsive to a control electrode of said first switching means coupled to a corresponding control electrode of said third switching means for causing said third switching means to be switched on if said first switching means is on, said first storage cell is selected, and said second storage cell is unselected.

4,125,878

MEMORY CIRCUIT

Hiroshi Watanabe, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

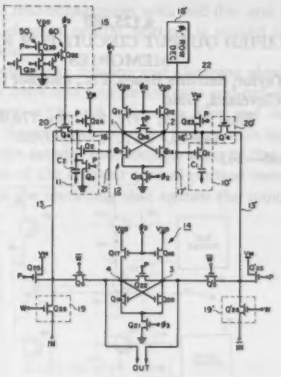
Filed Jul. 11, 1977, Ser. No. 814,849

Claims priority, application Japan, Jul. 12, 1976, 51-82693

Int. Cl.[2] G11C *11/40*

U.S. Cl. 365—208 **6 Claims**

1. A memory circuit comprising: memory cells comprised of a single field-effect transistor and a storage capacitor, said memory cells being arranged in an array of rows and columns and being divided into first and second row groups; differential amplifiers each having a first input terminal connected to the memory cells belonging to said first row group and also connected to each column, and a second input terminal connected to the memory cells associated with said second row group and also connected to the same column as the column connected to said first input terminal; common cross-coupled amplifier having first and second input terminals; a plurality of first and seconed means associated with the respective columns, said first means operatively connecting the first input terminal of a selected differential amplifier to the first input terminal of said



cross-coupled amplifier, said second means associated with the same column as that associated with said first means operatively connecting the second input terminal of said selected differential amplifier to the second input terminal of said cross-coupled amplifier; and means for controlling said first and second connecting means; whereby said first and second connecting means associated with the same column are controlled by the same controlling means.

4,125,879

DOUBLE ENDED STACK COMPUTER STORE

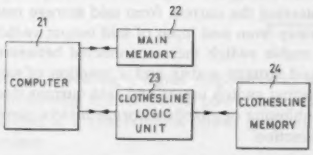
John L. Rodgers, Hanworth, and David Schofield, Hampton Hill, both of England, assignors to National Research Development Corporation, London, England

Filed Feb. 9, 1977, Ser. No. 767,221

Claims priority, application United Kingdom, Feb. 11, 1976, 5286/76

Int. Cl.[2] G11C *8/00*

U.S. Cl. 365—236 **4 Claims**



1. A computer store comprising a series of sequentially numbered storage locations, upper limit means for storing a first number indicating a storage location, means for incrementing said first number when data is written into the storage location indicated by said first number and decrementing said first number when data is read out from the storage location indicated by said first number, lower limit means for storing a second number indicating a storage location and means for decrementing said second number when data is written into the storage location indicated by said second number and incrementing said second number when data is read out from the storage location indicated by said second number, said respective means for incrementing and decrementing said first and second numbers each including means for setting the associated one of said first and second numbers to a value in accordance with the lowest numbered of said sequentially numbered

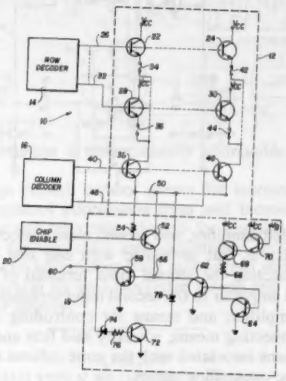
storage locations when incrementing from the highest numbered of said sequentially numbered storage locations and to set said associated one of first and second numbers to a value in accordance with the highest numbered storage locations when decrementing from the lowest numbered of said sequentially numbered storage locations.

4,125,880

SIMPLIFIED OUTPUT CIRCUIT FOR READ ONLY MEMORIES

David L. Taylor, Satellite Beach, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Mar. 9, 1977, Ser. No. 776,070
Int. Cl.[2] G11C *17/00, 7/00*
U.S. Cl. 365—242 **20 Claims**



1. In a memory having a storage matrix of a plurality of rows and a plurality of columns, an input means for selecting a storage location in said storage matrix by row and column and an output means for providing a voltage output representing a logic one or zero stored at said selected storage location, the improvement being said output means which comprises:

output switch means for providing a logic one or zero output and having an input;

current steering means connected to the output of said storage matrix and said input of said output switch means for controlling the output of said output switch means by steering the current from said storage matrix towards or away from said input of said output switch means; and

an enable switch means connected between said output of said storage matrix and a junction of said input to said output switch means and said current steering means for inhibiting or enabling storage matrix current to enter said junction.

4,125,881

TAPE MOTION CONTROL FOR REEL-TO-REEL DRIVE

John J. Eige; Arvind M. Patel; Spencer D. Roberts, all of San Jose, and David Stedman, Morgan Hill, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

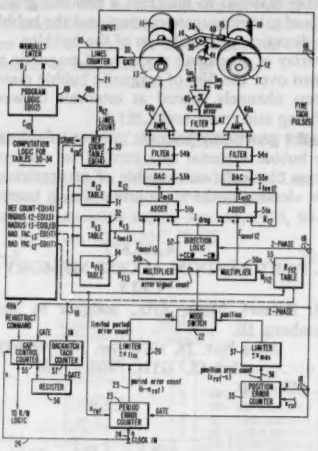
Filed May 19, 1977, Ser. No. 798,539
Int. Cl.[2] G11B *5/09*; G03B *1/04*
U.S. Cl. 360—50 **17 Claims**

1. A reel-to-reel tape transport apparatus wherein an unbuffered length of tape follows a substantially fixed-length path from a supply reel past a read/write head to a take-up reel and one more motor drives the take-up reel and another motor drives the supply reel to maintain appropriate tape motion at the read/write head, characterized by:

circuit means for providing a single gating pulse each time one of the reels rotates through a relatively large preselected angle;

circuit means for providing a plurality of pulses, one each time the other of the reels rotates through another angle which is substantially smaller than said preselected angle;

counter means for counting the numbers of said plurality of pulses;



means responsive to the single pulse to gate out the count from said counter means; and

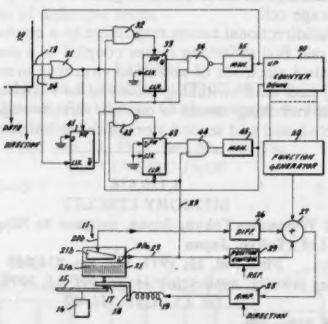
means responsive to each such gated out count to provide currents to each of said motors of a magnitude corresponding to said gated out count according to a predetermined servo algorithm for controlling rotation of said reels, thereby to provide continuing changes in currents as the radii of the reels change.

4,125,882

DISC FILE SYSTEM WITH IMPROVED SEEK CONTROL

Robert W. Erickson, Sr., and Robert W. Erickson, Jr., both of Pacific Palisades, Calif., assignors to PerSci, Inc., Marina Del Rey, Calif.

Filed Jun. 23, 1977, Ser. No. 809,087
Int. Cl.[2] G11B *5/52*
U.S. Cl. 360—78 **5 Claims**



1. In a disc file system to be connected to a control or command unit issuing and receiving data respectively to be stored on and retrieved from the disc file system, the system including at least one magnetic storage disc and at least one motor driven transducer being radially movable with reference to the disc for alignment with annular tracks of the disc, the unit issuing

pulses into a particular control line, the number of pulses issued representing a difference between a current track and a desired track on the disc, the combination comprising:

means for providing detent pulses representing passage of the transducer across the tracks upon movement of the transducer from a position of alignment with one of the tracks to a position of alignment with a different one of the tracks;

drive means for controlling the movement of the transducer in response to command signals including halting such movement when the transducer has arrived above the desired track;

first circuit means connected to said control line to be responsive to the pulses when in said line, and providing a first pulse following the trailing edge of each control line pulse;

second circuit means connected to said means for providing, to be responsive to said detent pulses when provided, and providing a second pulse following the trailing edge of each detent pulse;

third circuit means connected to the first circuit means to be responsive to said control line pulse and to said first pulse to provide a blocking signal beginning with a leading edge of each control line pulse and ending with each first pulse;

fourth circuit means included in said second circuit means and connected to the third circuit means to be responsive to said blocking signal to delay the production of a second pulse on the trailing edge of a detent pulse that occurs during the blocking signal; and

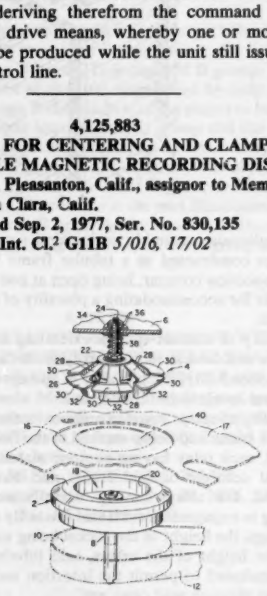
fifth circuit means connected to receive the first and second pulses for deriving therefrom the command signal to operate said drive means, whereby one or more detent pulses may be produced while the unit still issues pulses into the control line.

4,125,883

APPARATUS FOR CENTERING AND CLAMPING A FLEXIBLE MAGNETIC RECORDING DISC

Donald L. Rolph, Pleasanton, Calif., assignor to Memorex Corporation, Santa Clara, Calif.

Filed Sep. 2, 1977, Ser. No. 830,135
Int. Cl.[2] G11B *5/016, 17/02*
U.S. Cl. 360—99 **5 Claims**



1. Apparatus for centering and clamping a flexible magnetic recording disc in a disc drive, comprising

a spindle mounted to the end of a rotatable drive shaft and having at its outer end a face for supporting the associated recording disc and also a recess within said face, said recess being defined by an inner wall,

a disc clamping element mounted to said disc drive for rotation about an axis and selective movement toward said spindle for engagement with said spindle and away from said spindle, said element including a central portion encompassing said axis with a plurality of resiliently deflectable fingers extending outwardly therefrom, each of such fingers extending outwardly from said central portion in a direction toward said spindle and said drive shaft, the outermost portions of said fingers including means for cooperation with said recording disc and said spindle to deflect said fingers radially outwardly for centering the associated recording disc with respect to the center of said spindle and drive shaft and for clamping said recording disc against said spindle face when said clamping element is brought into engagement with said disc and said spindle and said element central portion is moved toward said spindle, and

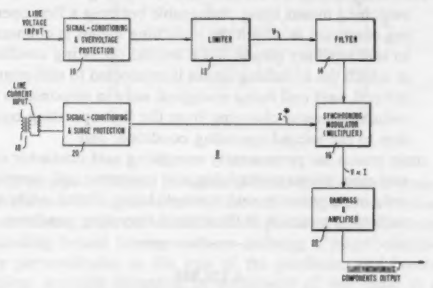
means for selectively moving said clamping element toward and away from said spindle and into and out of releasable engagement with said recording disc and said spindle, whereby the engagement of the fingers with the recording disc and the spindle and configuration of the fingers and movement of the element central portion serve to center and clamp the recording disc against the spindle face.

4,125,884

APPARATUS FOR DETECTING SUBSYNCHRONOUS CURRENT IN POWER SYSTEMS

Shan C. Sun, Bell Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 6, 1977, Ser. No. 757,177
Int. Cl.[2] H02H *3/26*
U.S. Cl. 361—79 **5 Claims**



1. Apparatus for providing a signal responsive to subsynchronous current flowing in an electrical power system having a voltage generated at a synchronous power generating frequency, comprising:

first means providing a first signal of constant amplitude having a frequency responsive to the synchronous frequency,

second means providing a second signal responsive to the current flowing in the power system, which may have a subsynchronous component in addition to the normal synchronous component,

third means processing said first and second signals to provide a third signal having first, second and third components whose frequencies are equal to (a) twice the synchronous frequency, (b) the sum of the synchronous and subsynchronous frequencies, and (c) the difference between the synchronous and subsynchronous frequencies, respectively,

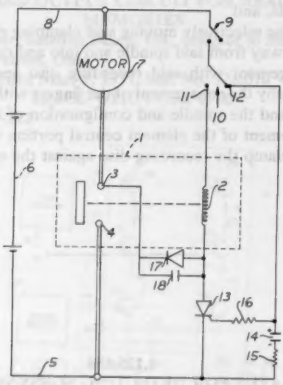
and fourth means processing said third signal to remove the first and second components thereof and provide a fourth signal responsive to the third component.

4,125,885

CONTROL APPARATUS

Leslie Lowther, and Tadeusz J. Pawlak, both of Leicester, England, assignors to Towmotor Corporation, Mentor, Ohio

Filed Sep. 21, 1977, Ser. No. 835,260
Claims priority, application United Kingdom, May 19, 1977, 21158/77
Int. Cl.[2] H02H 7/09
U.S. Cl. 361—114 7 Claims



1. Control apparatus for a contactor having a coil and at least one pair of contacts movable from an open position to a closed position in response to energizing the coil, comprising:

auxiliary means for temporarily energizing said contactor coil;

switching means for controllably energizing said coil, said switching means being changeable between a first operating condition at which the switching means is connected to said auxiliary means and a second operating condition at which the switching means is connected to said contactor coil, said coil being energized only in response to the switching means changing from the first operating condition to the second operating condition; and

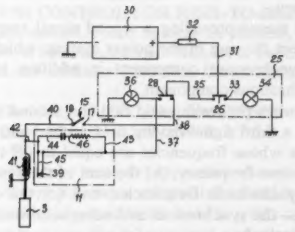
main means for permanently energizing said contactor coil, said main means maintaining said contactor coil energized only in response to said contacts being closed while said switching means is in the second operating condition.

4,125,886

PROTECTIVE INSTALLATION

Alfred D'Agostino, 13 Allee des Marronniers, 95120 Ermont, France

Filed Jun. 24, 1977, Ser. No. 809,613
Claims priority, application France, Jun. 28, 1976, 76 19566
Int. Cl.[2] H01H 47/04
U.S. Cl. 361—139 4 Claims



1. Apparatus for the protection of property comprising:

a housing, said housing being adapted to receive a pressurized gas container provided with a normally closed push-button type valve for controlling release of gas;

an electromagnet with a plunger-type core, said core being positioned to operate the gas container valve when the electromagnet is energized;

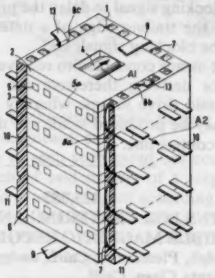
an electric supply circuit for the electromagnet, said supply circuit being adapted to be connected to an electric current source and including arming switch means and, control switch means, said supply circuit further including a holding circuit for said electromagnet, the closure of said arming switch means applying an operating potential to said control switch means and the closing of said control switch means energizing said electromagnet and said holding circuit.

4,125,887

SOCKET AND RELAY ASSEMBLY

Hans W. Reuting, Peine, Fed. Rep. of Germany, assignor to Elmeg Elektro-Mechnik GmbH, Peine, Fed. Rep. of Germany

Filed Mar. 8, 1976, Ser. No. 664,972
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1975, 2510167
Int. Cl.[2] H02B 1/04
U.S. Cl. 361—331 14 Claims



1. A multi-relay assembly comprising:

a socket constructed as a tubular frame having particular cross-section contour, being open at one end and having a height for accommodating a plurality of relays in different levels;

a plurality of contact springs extending inwardly from the frame and continued outwardly from the frame for external accessibility, the plurality of springs being arranged in several levels in the frame; and

a plurality of relays equal in number to the number of levels in the frame and being stacked in the frame, one relay per level, each relay having contour matching the cross-sectional contour of said frame and having a particular height, the relays having laterally extending contacts being in engagement with said inwardly extending contact springs, the height of the socket being an integral multiple of the height of the relays, said tubular frame being so dimensioned to permit the insertion and stacking of said relays through said open end.

4,125,888

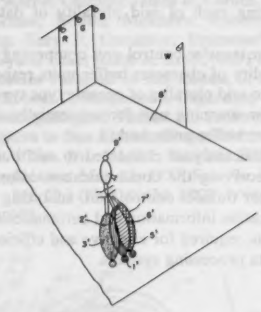
METHOD OF LIGHTING FOR COLORED SHADOWS

Michihiro Tsuchihashi; Masato Saito; Makoto Yamanoshita, all of Amagasaki; Hidetoshi Katsura, Kamakura; Osamu Myodo, Kamakura, and Koichiro Maeyama, Kamakura, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1977, Ser. No. 768,427
Claims priority, application Japan, Feb. 27, 1976, 51-20800
Int. Cl.[2] F21P 5/04
U.S. Cl. 362—231 4 Claims

1. A method of lighting for colored shadows which com-

prises arranging color light sources in three R, G and B groups of at least one light source for yellow to red (R group); at least one light source for green (G group) and at least one light



source for violet to blue (B group) and a white light source for white light (W group) and illuminating objects to obtain colored shadows of the objects to give the ratio of illuminance by the white light source;

$$i_W = \frac{I_W}{I_R + I_G + I_B + I_W} \leqq 0.5$$

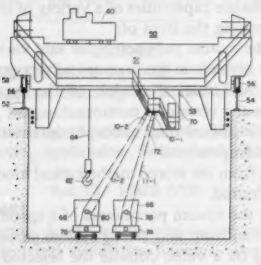
wherein I_W designates an illuminance at the part illuminated by only the white light source but the shadows to the lights of the light sources in the R group, G group and B group; I_R designates an illuminance at the part illuminated by only the light source in the R group in the shadow of the object to both of the lights and of the light source in the G group and the B group; I_G designates an illuminance at the part illuminated by only the light source in the G group in the shadow of the object to both of the lights of the light sources in the R group and the B group and I_B designates an illuminance at the part illuminated by only the light source in the B group in the shadow of the object to both of the lights of the light sources in the R group and the G group.

4,125,889

TRANSPORTATION ARRANGEMENT WITH SPOTLIGHT PROJECTORS FOR ILLUMINATING TRUNNIONS OF A MOLTEN IRON LADLE

Yukio Hosaka; Kunio Matsui, both of Fukuyama, and Tomio Yamamoto, Takamatsu, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo and Fuji Toyuki Kabushiki Kaisha, Takamatso, both of, Japan

Filed Jul. 26, 1976, Ser. No. 708,350
Claims priority, application Japan, Jul. 30, 1975, 50-92106
Int. Cl.[2] F21V *33/00*
U.S. Cl. 362—253 **2 Claims**



1. A transportation arrangement for illuminating trunnions of a molten iron, ladle, comprising: a bridge girder mounted on rails at a right angle with said rails; said rails being constructed underneath a ceiling of a building in longitudinal direction; a car arranged on said bridge girder for freely traversing thereon; a hoisting device for hoisting a load and having a hoisting hook and wire mounted on said traversing car; an operating room installed underneath said bridge girder; a plurality of spotlight projectors rotatably disposed in said operating room projecting a bundle of parallel light beams; a ladle car movable on rails constructed on the floor of the building for travelling in a direction of movement of said bridge girder; and a molten iron ladle positionable on said ladle car and having trunnions for engagement with the hoisting hook of said hoisting device;

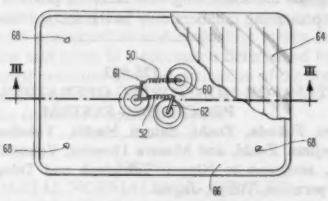
wherein the improvement comprises, said spotlight projectors having means for emanating green and yellow bright-line spectra occupying a majority of said parallel light beams to the trunnions of said molten iron ladle, whereby said trunnions are engaged by said hook and are clearly discriminated by directing said light beams from said spotlight projectors in a direction of said trunnions of said molten iron ladle during the presence of radiant rays from the molten iron.

4,125,890

PARABOLIC REFLECTOR INCLUDING FILAMENT LOCATING MEANS

Roy A. Nixon, Jr., Greenville, Ohio, assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 10, 1976, Ser. No. 749,450
Int. Cl.[2] F21V *7/00*
U.S. Cl. 362—348 **10 Claims**



1. A concave reflector for a sealed-beam incandescent lamp, said reflector having an inner surface exhibiting a cross-section approximating a parabola, and including at least three discrete, upstanding bosses having surfaces defining a plane substantially perpendicular to the axis of the parabola, said bosses enabling accurate mounting of a filament of said lamp at a predetermined position with respect to the latus rectum of the lamp.

4,125,891

ARRANGEMENT FOR PROTECTING DATA STORED IN A DIGITAL COMPUTER

Guy G. Sauger, Nogent/Marne, France, assignor to Cii Honeywell Bull (Compagnie Internationale pour L'informatique), Paris, France

Filed Sep. 3, 1976, Ser. No. 720,209
Claims priority, application France, Sep. 5, 1975, 75 27283
Int. Cl.[2] G06F *5/02*
U.S. Cl. 364—200 **7 Claims**

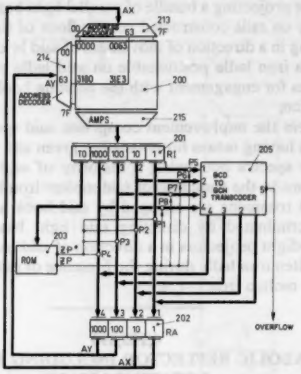
1. In combination with a computer,

the computer including: a first group of addresses for one type of computer instruction, said first group of addresses being represented in the computer as first signals representing numbers in a first base, and a second group of addresses for a second type of computer instruction, said second group of addresses being represented in the computer as second signals representing numbers in a second base, the numerical value of the second base exceeding that of the first base so that all of the addresses of the first

base are expressed by numbers that form only some of the numbers of the second base;

a memory with a portion thereof for storing computer instructions at addresses represented by numbers in the second base;

means responsive to the first signals for converting the first



signals, representing addresses of the first base, into third signals representing addresses of the second base in response to an indication of the one type of computer instructions being read out of or into memory;

and means selectively responsive to the second and third signals for addressing said memory portion with signals representing numbers only in the second base.

4,125,892

SYSTEM FOR MONITORING OPERATION OF DATA PROCESSING SYSTEM

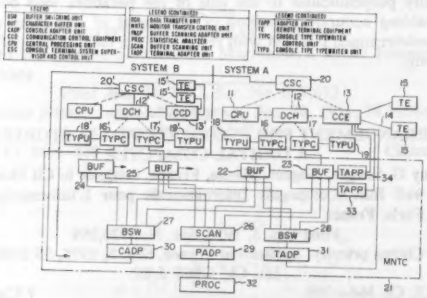
Shigeru Fukuda, Zushi; Satoru Narita, Yokohama; Makoto Maejima, Zushi, and Masaru Homma, Yokosuka, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 566,248, Apr. 9, 1975, abandoned. This application Jun. 29, 1977, Ser. No. 811,241

Claims priority, application Japan, Apr. 17, 1974, 49/42865

Int. Cl.[2] G06F *11/06*

U.S. Cl. 364—200 **5 Claims**



1. A system for monitoring the operation of a data processing system comprising

(A) a plurality of data processing systems each comprising

(a) a central processing unit,

(b) a plurality of console type typewriters connected through a data transfer unit to said central processing unit for transferring communication information to and from said central processing unit,

(c) a plurality of remote terminals connected to said central processing unit through a communication control equipment, and

(d) a console terminal system supervisor and control unit connected to said data transfer unit for supervising and controlling each of said plurality of data processing systems;

(B) a monitor transfer control unit comprising

(a) a plurality of character buffer units respectively connected to said plurality of console type typewriters, and

(b) a buffer scanning unit for sequentially scanning said character buffer units; and

(C) a statistical analyzer connected to said buffer scanning unit for receiving the communication information from said monitor transfer control unit, analyzing the received communication information and automatically summarizing the data required for effective and efficient utilization of said data processing systems.

4,125,893

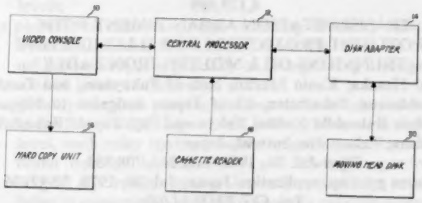
INTEGRATED REFRACTIVE EFFECTS PREDICTION SYSTEM

Herbert V. Hitney; Juergen H. Richter, both of San Diego, Calif., and Murray H. Schefer, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 25, 1977, Ser. No. 781,243

Int. Cl.[2] G06F *9/06*

U.S. Cl. 364—300 **9 Claims**



1. The method of assessing the influence of the atmospheric environment from sea level to eight kilometers above sea level on the performance capabilities of a variety of electromagnetic systems comprising the steps of:

a. storing the system parameters for said variety of electromagnetic systems in the memory of a computer,

b. storing mathematical models of the types of displays desired in the computer memory,

c. entering near-real time atmospheric environmental data into the computer,

d. selecting from the stored mathematical models the type of display desired,

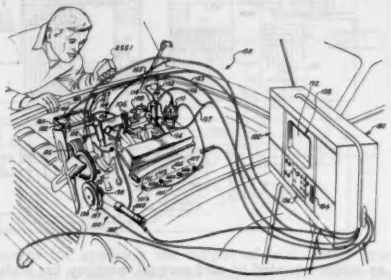
e. selecting the system parameters of a specific electromagnetic system from said stored system parameters and

f. observing on a video console the selected display of the performance capabilities of the selected electromagnetic system.

4,125,894
ENGINE TEST AND DISPLAY APPARATUS

Aloysius T. Cashel, Mt. Prospect; Frank Perna, Barrington; Gerald C. Trussell, Park Ridge; Alfred C. D'Souza, Chicago; Richard A. Karlin, Chicago; James R. Caruth, Chicago; Gary L. Van Ermen, Rolling Meadows; Robert W. Arnston, Schaumburg; Gary F. Comiskey, Evanston; Frederick R. Borgens, Crystal Lake; Keith A. Kreft, Mt. Prospect; Arthur Damm, Franklin Park, all of Ill.; Dennis C. Sienaski, Saint Ann, Mo.; Robert C. Shepardson, Cupertino, Calif.; Yam C. Leung, Bloomingdale, and Thomas M. Jankowski, Cary, both of Ill., assignors to Sun Electric Corporation, Chicago, Ill.

Continuation of Ser. No. 641,362, Dec. 16, 1975, abandoned.
This application May 18, 1977, Ser. No. 798,181
Int. Cl.[2] G06F *15/50*; F02P *5/04*
U.S. Cl. 364—442 **128 Claims**



1. Improved apparatus for measuring the dwell of an ignition system of an internal combustion engine having a predetermined number of cylinders and fuel ignitors, said ignition system comprising a switch periodically opened and closed in synchronism with the rotation of the engine in order to create time-spaced ignition pulses for firing the ignitors, the switch being closed for a dwell time period and being open for a firing time period in order to create such ignition pulse, said apparatus comprising:

clock means for producing clock pulses at a predetermined rate;

first counter means for counting the clock pulses;

second counter means for counting the clock pulses;

first gate means for transmitting clock pulses to the first counter means in response to a first one of the ignition pulses and for preventing the transmission of clock pulses to the first counter means in response to a second one of the ignition pulses;

second gate means for transmitting clock pulses to the second counter means only during the duration of one or more dwell time periods which occur between the first ignition pulse and the second ignition pulse;

processor means for producing a digital dwell signal having a value proportional to the count of the second counter means divided by the count of the first counter means; and

display means for displaying a swell number having a value proportional to the value of the dwell signal.

4,125,895
MAXIMUM-POWER MOTOR

Gerold P. Buhlmann, Stalden, Switzerland, assignor to Fritz Arn, Zürich, Switzerland

Filed Aug. 25, 1977, Ser. No. 827,807
Claims priority, application Switzerland, Aug. 26, 1976, 10825/76
Int. Cl.[2] H02J *3/00*
U.S. Cl. 364—483 **10 Claims**

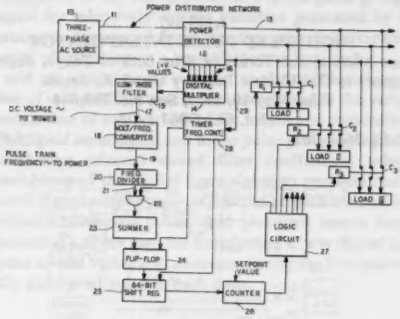
1. A monitoring device for maintaining a mean maximum power of an electrical installation having a plurality of loads connected to a supply network, said device comprising:

power-detector means responsive to the power drawn by said loads and producing a direct-current voltage proportionally to the drawn power;

a voltage-frequency converter connected to said power-detector means for transforming said direct-current voltage proportional to power into a pulse train of a frequency proportional to the detected power;

summing means connected to said converter for summing pulses of said train between two cycle pulses having an interval defining the cycle time of the device;

a flip-flop connected to said summing means and changing



state upon said summing means accumulating a value in excess of a predetermined threshold;

a shift register connected to said flip-flop and registering the switching state thereof;

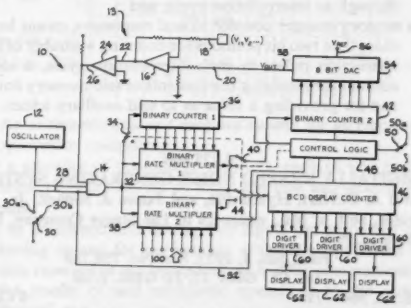
means for evaluating the contents of said shift register for each operating cycle; and

a logic circuit connected to said evaluating means for disconnecting said loads in a succession determined by preprogrammed priorities upon an evaluation of the contents of said shift register manifesting an excess power drain during the respective operating cycle.

4,125,896
DIGITAL NORMALIZING CIRCUIT

William T. Metcalf, North Amherst, Mass., assignor to Hentschel Instruments, Inc., Ann Arbor, Mich.

Filed Jun. 15, 1977, Ser. No. 806,820
Int. Cl.[2] G06J *1/00*
U.S. Cl. 364—606 **7 Claims**



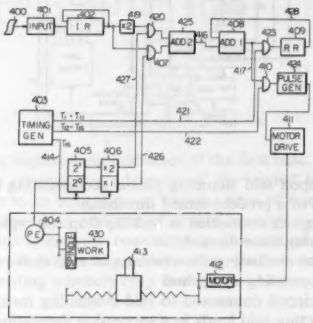
1. A computing circuit for producing a digital output representing the ratio between a selected pair of a plurality of analog signals, said computing circuit comprising means for producing pulse signals at a constant rate, first counter means, output counter means connected to said pulse signal producing means, control means having an input to which said analog signals are successively supplied, said control means being operable to provide for the transmission of pulse signals representative of a predetermined one of said analog signals to said first counter

means, said first counter means connected to said pulse producing means for retaining a digital representation of said predetermined analog signal where said digital representation is proportional to said predetermined analog signal, and pulse signal control means connected to said first counter means where for each successive analog signal supplied to said control means input, said control means and said pulse signal control means cooperate to control the pulse signals produced by said pulse signal producing means to accumulate a count in said output counter means representing said ratio.

4,125,897
HIGH SPEED PULSE INTERPOLATOR

Kazuo Murata, and Terukazu Kito, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Japan

Filed May 10, 1977, Ser. No. 795,644
Int. Cl.[2] G06J *1/02*
U.S. Cl. 364—702 **5 Claims**



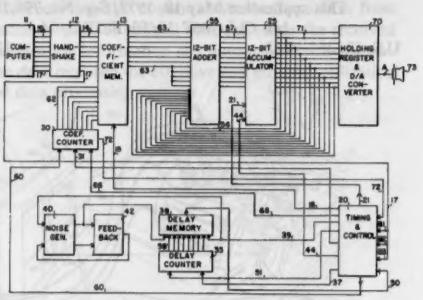
1. A high speed interpolation system comprising
a first register having a predetermined value,
a second register for storing a temporary value,
an auxiliary adder for obtaining *m* multiple of the contents of said first register,
an interpolation adder for obtaining the sum of the contents of said first register and an output of said auxiliary adder and applying the reminder of the sum of the addition to said second register with the carry of the addition producing an output interpolation pulse,
means responsive to said interpolation pulse for operating through an interpolation cycle, and
a memory counter coupled to said responsive means having more than two bit positions for counting a number of input instruction pulses in each interpolation cycle, a second counter for receiving the contents of said memory counter and for providing a value *m* to said auxiliary adder.

4,125,898
DIGITALLY SHAPED NOISE GENERATING SYSTEM

David A. DeHart, Hyattsville, and James J. Ridgell, Jr., Elkridge, both of Md., assignors to The Singer Company, Binghamton, N.Y.

Filed Jan. 5, 1977, Ser. No. 756,789
Int. Cl.[2] G06F *15/34;* G10L *1/08*
U.S. Cl. 364—718 **6 Claims**

1. An acoustic system under the control of a computer for digitally generating spectrally shaped noise of any desired amplitude versus frequency shape by using a simple additive process, said system comprising:
a. means for serially generating one bit wide random noise;
b. a first memory coupled to said generating means for sequentially storing the noise received from said generating means;
c. a first counter coupled to said first memory for sequentially addressing the memory locations contained in said first memory;
d. a second memory coupled to said computer for sequentially storing the digital time impulse response coefficients that represent the amplitude versus frequency shape of said noise which has been generated by said computer;
e. a plurality of selectors coupled to said computer and said second memory for loading, clearing and incrementing said second memory with digital time impulse response coefficients;
f. a second counter coupled to said second memory for sequentially addressing the memory locations contained in said second memory;



g. an adder coupled to said second memory for adding the digital time impulse response coefficient currently being processed;
h. a hold register the input of which is coupled to the output of said adder and, the output of said hold register is coupled to the input of said adder so that said hold register will only store the output of said adder if the noise currently being sampled has the same polarity as the logic that triggers said system; and
i. cyclic timing means coupled to said first memory, said second memory, said first counter, said second counter, said adder and said hold register for maintaining said system in synchronization whereby upon the completion of a cycle of said timing means the output of said hold register will be spectrally shaped digital noise samples.

4,125,899
BESSEL FUNCTION TYPE AUTOMATIC DELAY EQUALIZER

Kazuo Kawai, Yokohama; Michitoshi Tamori, Tokyo; Hidetaka Yanagidaira, Omiya, and Sotokichi Shintani, Mitaka, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

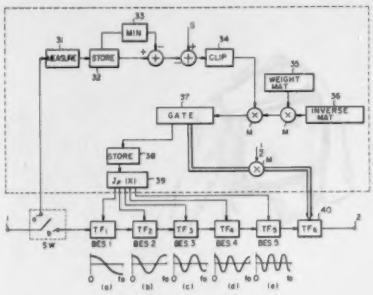
Filed Jun. 17, 1977, Ser. No. 807,671
Claims priority, application Japan, Jun. 17, 1976, 51-70335
Int. Cl.[2] G06F *15/34;* H03H *7/16*
U.S. Cl. 364—724 **1 Claim**

1. A bessel function type automatic delay equalizer comprising
(a) a plurality of cascaded transversal filters, each having an independent delay cosine equalization component having a predetermined period,
(b) measuring means for measuring the discrete delay characteristics of a transmission line on the frequency axis using a sweep signal,
(c) a switch means for alternately connecting the input terminal of the equalizer and the transmission line to be equalized to said transversal filters or to the measuring means of the delay characteristics,
(d) generating means, coupled to the measuring means, for generating the inverse of the measured delay characteristics,
(e) inverse matrix memory means,
(f) weight matrix memory means,

(g) a first multiplication means, coupled to said inverse matrix memory means and said weight matrix memory means, for obtaining the product of a predetermined inverse matrix concerning the cosine component and a predetermined weight matrix,

(h) a second multiplication means, coupled to said first multiplication means and said generating means, for obtaining the product of the output of said first multiplication means and the inverse of the measured delay characteristics,

(i) a Bessel function generator for providing the Bessel function of the output of said second multiplication means,



(j) means for applying the output of said Bessel function generator to said transversal filters for controlling the tap gain of the transversal filters,

(k) a negative pair type transversal filter connected in series to said transversal filters, said negative pair type transversal filter being controlled by the output of said second multiplication means,

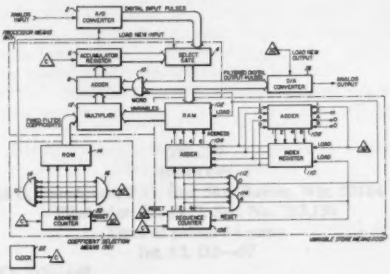
(l) an output terminal of the equalizer connected to the output of the negative pair type transversal filter.

4,125,900

CASCADED RECURSIVE DIGITAL FILTER

William L. Betts, St. Petersburg, Fla., assignor to NCR Corporation, Dayton, Ohio

Filed Jul. 1, 1977, Ser. No. 812,082
Int. Cl.[2] G06F *7/38, 15/34*
U.S. Cl. 364—724 **10 Claims**



1. A cascaded digital recursive filter for filtering digital input pulses from a time varying digital input signal by repetitively implementing a sequence of filter equations which include a predetermined number of filter coefficients to generate a filtered digital output signal comprising a series of filtered digital output pulses, said filter comprising in combination:

(a) timing means for generating a series of timing pulses;

(b) coefficient selection means including storage means containing stored filter coefficients, said coefficient selection means being responsive to the timing pulses from said timing means for generating a pulse grouping signal, for grouping the timing pulses into repetitive trains of individually numbered pulses, and for reading out on a coefficient output line a repetitive series of stored filter coefficients, each of said stored filter coefficients being associated with one of the individualy numbered pulses in each of said trains of pulses;

(c) processor means;

(d) variable store means coupled to said processor means and responsive to the timing pulses and to the pulse grouping signal for selectively storing variables generated by said processor means and for generating a partially repetitive series of variables on a variable output line; and

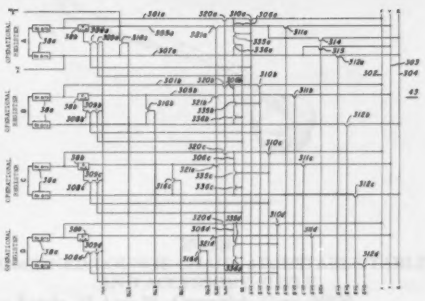
(e) said processor means coupled to the coefficient output line of said coefficient selection means and to the variable output line of said variable store means and responsive to the digital input signal and to the pulse grouping signal for combining selected stored filter coefficients, selected variables and the digital input signal to generate one filtered digital output pulse at the end of each train of individually numbered pulses, said processor means further including a select gate for transferring a new digital input pulse to said variable store means during the first individually numbered pulse in each train.

4,125,901

ELECTRONIC CALCULATOR OR MICROPROCESSOR HAVING A MULTI-INPUT ARITHMETIC UNIT

Thomas E. Merrow, Dallas; Stephen P. Hamilton; Larry L. Miles, both of Garland, and Charles P. Grant, Jr., deceased, late of Dallas, Tex. (by Charles P. Grant, Sr., executor), assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 27, 1976, Ser. No. 736,057
Int. Cl.[2] G06F *7/48*
U.S. Cl. 364—736 **13 Claims**



1. An arithmetic unit and memory system for an electronic microprocessor comprising:

(a) a plurality of operational registers, each of said operational registers having an input and first and second outputs,

(b) an arithmetic unit having two inputs and an output and having means for performing arithmetic operations on data received at the inputs thereof and for communicating the results of said arithmetic operations to the output thereof, and

(c) a plurality of operational register selector gates interconnecting said plurality of operational registers and said arithmetic unit for connecting a selected one of said first and second outputs of a selected one of said operational registers to one of the inputs of said arithmetic unit.

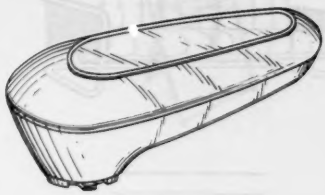
DESIGNS

NOVEMBER 14, 1978

250,226
JACKET, OR SIMILAR ARTICLE
Ted G. Shaw, Northbrook, Ill., assignor to Teddy Gee, Inc., Deerfield, Ill.
Filed Nov. 29, 1976, Ser. No. 745,521
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—184

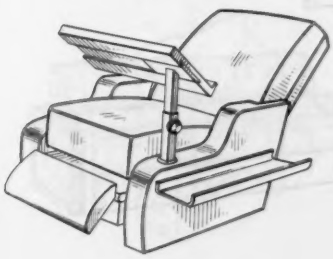
250,227
BUTTON
Daniel G. Baughman, P.O. Box 541, Darien, Wis. 53114
Filed Mar. 31, 1977, Ser. No. 783,156
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—449

250,228
ELECTRICAL FACIAL BRUSH
Douglas G. Long, Lombard, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Jul. 1, 1977, Ser. No. 812,346
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—14

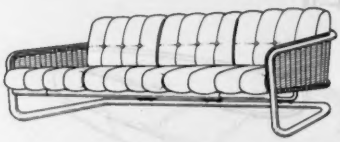


250,229
BODY SCRUBBER
Gary M. Werner, Newport News, Va., assignor to Riker Laboratories, Inc., Northridge, Calif.
Filed Jul. 12, 1976, Ser. No. 704,372
Term of patent 14 years
Int. Cl. D4—*02;* D7—*05;* D28—*03*
U.S. Cl. D4—32

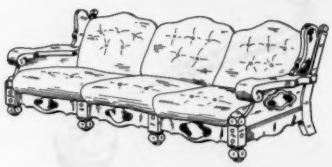
250,230
COMBINED LOUNGE CHAIR, ADJUSTABLE TABLE AND ACCESSORY SHELF
Stine Kotula, 37 Arch St., Greenwich, Conn. 06830
Filed Dec. 6, 1976, Ser. No. 747,819
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—42



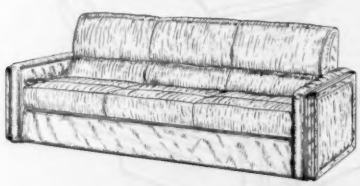
250,231
SEAT
Robert L. Wilson, Senatobia, Miss., assignor to Chromcraft Corporation, Senatobia, Miss.
Filed May 23, 1977, Ser. No. 799,618
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56



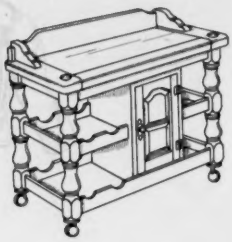
250,232
SEAT OR SIMILAR ARTICLE
Stanley P. Nash, Johnson Creek, Wis., assignor to Schweiger Industries, Inc., Jefferson, Wis.
Filed Apr. 11, 1977, Ser. No. 786,090
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—62



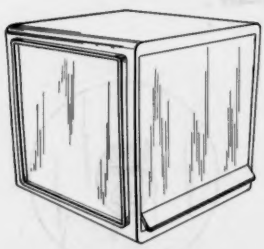
250,233
SEAT
Donald H. Opper, LaGrange, Ill., assignor to Kroehler Mfg. Co., Naperville, Ill.
Filed May 11, 1977, Ser. No. 796,047
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



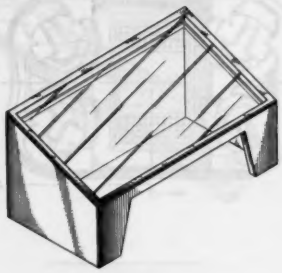
250,234
SERVER
Nicholas A. Ungaro, Louisville, Ky., assignor to Peters-Revington Corporation, Delphi, Ind.
Filed Oct. 8, 1976, Ser. No. 730,898
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—153



250,235
CABINET OR SIMILAR ARTICLE
Robert A. Chervenak, Seattle, Wash., assignor to COMERCO, INC., Tacoma, Wash.
Filed Nov. 8, 1976, Ser. No. 740,001
The portion of the term of this patent subsequent to Sep., 1992, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—167



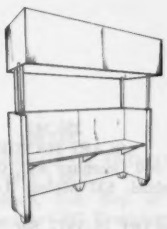
250,236
DISPLAY CABINET OR SIMILAR ARTICLE
Hubert L. Lambert, 3512 Arcadia St., Apt. A, Norfolk, Va. 23502
Filed Apr. 22, 1977, Ser. No. 790,049
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—173



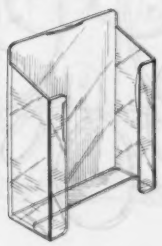
250,237
COMBINED TABLE, SHELF AND CABINET UNIT
Franz Hero, and Karl Odermatt, both of Hinwil, Zurich, Switzerland, assignors to Interlübke Gebr. Lübke KG, Wiedenbrück, Fed. Rep. of Germany
Filed Nov. 2, 1976, Ser. No. 738,235
Claims priority, application Fed. Rep. of Germany, May 7, 1976, 877
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—174

250,238
FOLDING BAR TABLE
Stuart Minsky, 18 Nome Dr., Woodbury, N.Y. 11797
Filed Mar. 9, 1977, Ser. No. 776,097
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—178

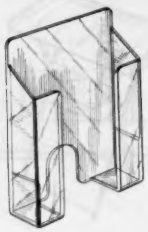
250,239
SELF-SERVICE UNIT FOR MERCHANDISING FOOD AND BEVERAGES
Albert E. Pool, Fort Worth, Tex., and Lloyd J. Lewis, Decatur, Ga., assignors to Modular Engineering Corporation, Atlanta, Ga.
Filed Jun. 23, 1976, Ser. No. 699,060
Term of patent 14 years
Int. Cl. D6—*04;* D20—*02*
U.S. Cl. D6—181



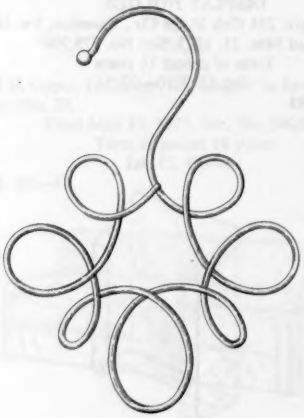
250,240
DISPLAY HOLDER
Paul A. Braginetz, 214 Oak Ridge Cir., Staunton, Va. 24401
Filed Mar. 21, 1977, Ser. No. 779,900
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—181



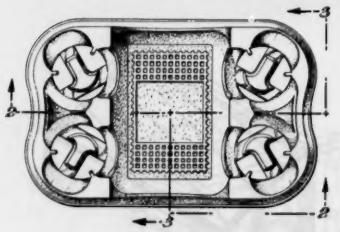
250,241
DISPLAY HOLDER
Paul A. Braginetz, 214 Oak Ridge Cir., Staunton, Va. 24401
Filed Mar. 21, 1977, Ser. No. 780,272
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—181



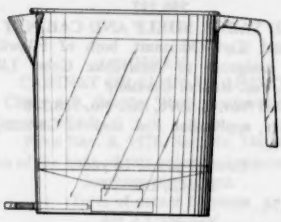
250,242
SCARF HANGER
Gladys Knobel, 340 Greenbay Rd., Glencoe, Ill. 60022, and Theodore Prisland, 632 Melody La., Highland Park, Ill. 60035
Filed Oct. 25, 1977, Ser. No. 845,157
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—247

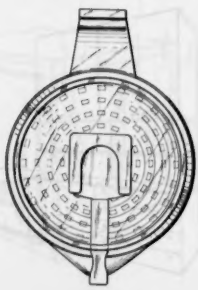


250,243
COMBINED FOOD AND BEVERAGE TRAY
Henry R. Vigue, Waterville, Me., assignor to Keyes Fibre Company
Filed Feb. 18, 1977, Ser. No. 769,853
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—38

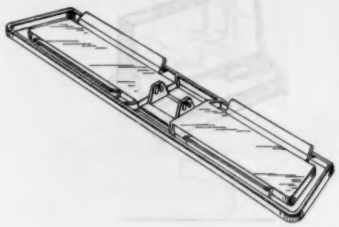


250,244
COMBINED LIQUID FOOD SEPARATOR AND DISPENSER WITH ATTACHABLE STRAINER
Angelo Antolino, Pelham Manor, N.Y., assignor to New Colony Inventions, Inc., Mount Vernon, N.Y.
Filed Apr. 29, 1977, Ser. No. 792,489
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—64

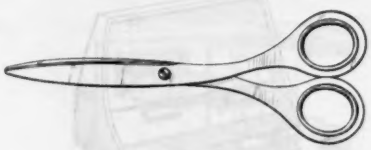




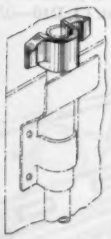
250,245
MOP HEAD
Richard H. Bebb, Wilmslow, England, assignor to Imperial Chemical Industries Limited, London, England
Filed Sep. 16, 1976, Ser. No. 723,899
Claims priority, application United Kingdom, Mar. 24, 1976, 975047/76
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—178



250,246
SCISSORS
Alan Spigelman, 235 E. 22nd St., New York, N.Y. 10010
Filed Mar. 25, 1977, Ser. No. 781,284
Term of patent 7 years
Int. Cl. D8—*03*
U.S. Cl. D8—57



250,247
CAM LATCH
John V. Pastva, Parma Heights, Ohio, assignor to The Eastern Company, Cleveland, Ohio
Filed Aug. 6, 1976, Ser. No. 712,190
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—339



250,248
DISPENSING CONTAINER
John A. Grip, Matawan, N.J., assignor to American Cyanamid Company, Stamford, Conn.
Filed Nov. 16, 1976, Ser. No. 742,297
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—44

250,249
MULTIPLE UNIT PACKAGE OF ANIMAL FOOD OR THE LIKE
Raimund Flecken, Steinbach, Fed. Rep. of Germany, assignor to J. Latscha Frankfurt KG, Frankfurt am Main, Fed. Rep. of Germany
Division of Ser. No. 396,216, Sep. 11, 1973, Pat. No. Des. 241,819. This application May 27, 1976, Ser. No. 690,507
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1973, 73 MR 8149
Term of patent 14 years
Int. Cl.[2] D9—*03*
U.S. Cl. D9—193

250,250
HOLDER FOR AN AEROSOL CAN OR THE LIKE
Robin Cheng, and Kenneth M. Cross, both of Penshurst, Australia, assignors to 3C Chemical Laboratories Pty. Limited, Australia
Filed Sep. 28, 1976, Ser. No. 727,482
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—224

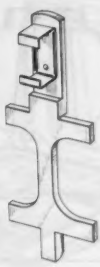
250,251
CLOCK CASING
Murray J. Stuart, and Timothy J. Moe, both of Ft. Lauderdale, Fla., assignors to The Time Machine Inc.
Filed Sep. 28, 1976, Ser. No. 727,451
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—1

250,252
DIGITAL CLOCK
Donald J. Booty, Frankfort, Ill., assignor to Spartus Corporation, Chicago, Ill.
Filed Feb. 24, 1977, Ser. No. 771,822
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15

250,253
DIGITAL CLOCK
Donald J. Booty, Frankfort, Ill., assignor to Spartus Corporation, Chicago, Ill.
Filed Feb. 24, 1977, Ser. No. 771,823
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15

250,254
DIGITAL CLOCK
Donald J. Booty, Frankfort, Ill., assignor to Spartus Corporation, Chicago, Ill.
Filed Feb. 24, 1977, Ser. No. 771,824
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15

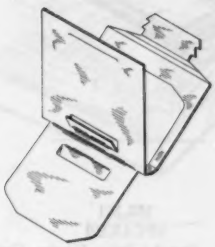
250,255
ELECTRICAL BOX SETTING GAUGE
Neil W. Douglas, and William C. Cress, Jr., both of Sanford, N.C., assignors to D. & C. Manufacturing Co., Inc.
Filed Oct. 6, 1976, Ser. No. 730,331
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64



250,256
RECREATIONAL TRAILER
Isaiah T. Battles, Sr., 830 E. 5th St., Erie, Pa. 16507
Filed Feb. 4, 1977, Ser. No. 765,449
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—103

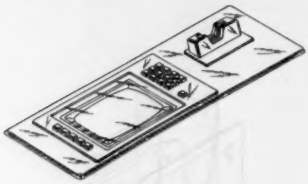
250,257
MOBILE CHAIR
Arthur E. Pfohl, 95 W. Square Lake Rd., Troy, Mich. 48098
Filed Dec. 20, 1976, Ser. No. 752,075
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—131

250,258
ARTICLE HOLDER MOUNTED ON AN AUTOMOBILE VISOR
Gordon D. Lookatch, 6200 N. Sunny Point Rd., Glendale, Wis. 53217
Filed Feb. 9, 1977, Ser. No. 766,913
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—191



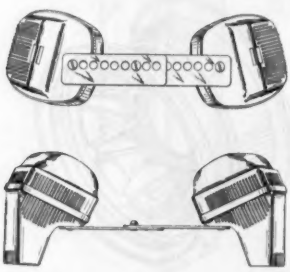
250,259
WHEEL DESIGN
Philip G. Patch, San Juan Capistrano, Calif., assignor to Keystone Products, Inc., Ontario, Calif.
Continuation-in-part of Ser. No. 815,888, Jul. 15, 1977, abandoned. This application Oct. 5, 1977, Ser. No. 840,181
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209

250,260
COMBINED CONTROL AND DISPLAY PANEL
Charles T. Inatomi, Los Angeles County, Calif., assignor to Transaction Technology, Inc., Los Angeles, Calif.
Filed Mar. 21, 1977, Ser. No. 779,704
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—40

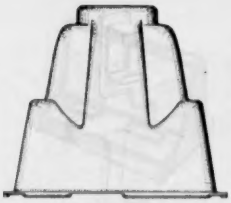


250,261
SPEAKER
William W. Phillips, Rancho Palos Verdes, Calif., assignor to Shaymar, Inc., Beverly Hills, Calif.
Filed Nov. 1, 1976, Ser. No. 737,062
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—33

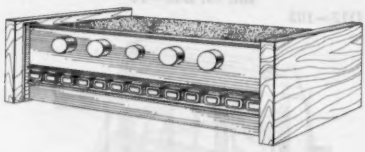
250,262
STEREO SPEAKER UNIT
William W. Phillips, Rancho Palos Verdes, Calif., assignor to Shaymar, Inc., Beverly Hills, Calif.
Filed Nov. 1, 1976, Ser. No. 737,184
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—33



250,263
PROJECTION LENS SUPPORT ENCLOSURE FOR ATTACHMENT TO A TELEVISION RECEIVER
Theophile L. De Zinno, 1337 SW. 14th St., Miami, Fla. 33133
Filed May 27, 1977, Ser. No. 801,299
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—84



250,264
ELECTRONIC CONTROL CABINET
Frederick W. Thompson, Soquel, Calif., assignor to Atari, Inc., Sunnyvale, Calif.
Filed Feb. 2, 1977, Ser. No. 764,889
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—96



250,265
CAMERA-PROCESSOR
Gregory Fossella, Marshfield, and Michael Mercadanti, North Quincy, both of Mass., assignors to Itek Corporation, Lexington, Mass.
Filed May 17, 1976, Ser. No. 686,759
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—02

250,266

MICRFORM READER/VIEWER OR SIMILAR ARTICLE

John W. Overman, Colgate, Wis., assignor to Bell & Howell Company, Chicago, Ill.

Filed Feb. 4, 1977, Ser. No. 765,512

Term of patent 14 years

Int. Cl.[2] D16—*03*

U.S. Cl. D16—11

250,267

PHOTOGRAPHIC FLASH UNIT

Claus Prochnow, and Dieter Mankau, both of Braunschweig, Germany, assignors to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

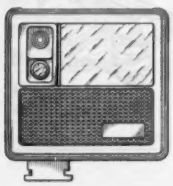
Filed Dec. 28, 1976, Ser. No. 755,086

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1976, MR 1096

Term of patent 14 years

Int. Cl. D16—*05*

U.S. Cl. D16—42



250,268

PERPETUAL CALENDAR

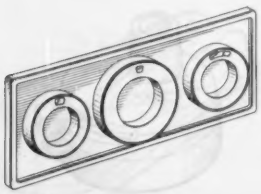
Eli Sasson, 605 N. Bedford, Beverly Hills, Calif. 90210

Filed Aug. 23, 1976, Ser. No. 713,745

Term of patent 14 years

Int. Cl. D19—*03*

U.S. Cl. D19—25



250,269

COMBINED PUNCHER, STAPLER AND HOLDER FOR DESK UTENSILS

Roland Speilier, Lemgo, Fed. Rep. of Germany, assignor to Firma Richard Heinze GmbH & Co. KG, Herford, Fed. Rep. of Germany

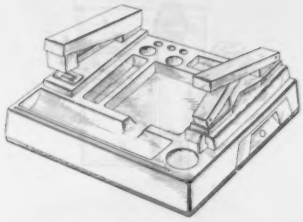
Filed Oct. 14, 1975, Ser. No. 622,203

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1975, 6MR1249

Term of patent 14 years

Int. Cl. D19—*02*

U.S. Cl. D19—72



250,270

COMBINED PUNCHER, STAPLER AND HOLDER FOR DESK UTENSILS

Roland Speilier, Lemgo, Fed. Rep. of Germany, assignor to Firma Richard Heinze GmbH & Co. KG, Herford, Fed. Rep. of Germany

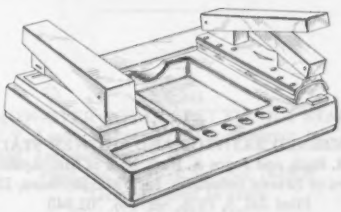
Filed Oct. 14, 1975, Ser. No. 622,320

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1975, 6 MR 1235

Term of patent 14 years

Int. Cl. D19—*02*

U.S. Cl. D19—72



250,271

TELESCOPIC SIGHT MOUNT

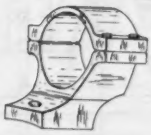
Paul D. Williams, Davison, Mich., assignor to Williams Gun Sight Co., Davison, Mich.

Filed Jun. 1, 1976, Ser. No. 691,356

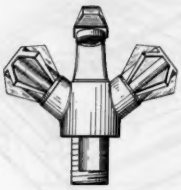
Term of patent 14 years

Int. Cl. D22—*01*

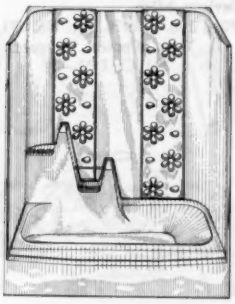
U.S. Cl. D22—7



250,272
FAUCET
Wilfred L. Jones, Halesowen, England, assignor to IMI Opella Limited of Hereford, Hereford, England
Filed Apr. 24, 1975, Ser. No. 571,355
Claims priority, application United Kingdom, Oct. 25, 1974, Des. 968412
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—25



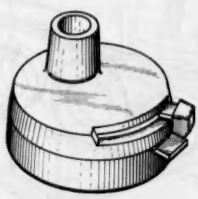
250,273
COMBINED BATHTUB AND SHOWER STALL
Kenneth B. Rath, and Joyce A. Rath, both of Murphysboro, Ill., assignors to Bracon Industries, Inc., Mu:physboro, Ill.
Filed Jul. 6, 1976, Ser. No. 702,940
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—49



250,274
WOOD STOVE
Roy Whipple, P.O. Box 43, Hager City, Wis. 54014
Filed Aug. 18, 1977, Ser. No. 825,695
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

250,275
SELF-ATTACHING PROBE FOR USE IN PHOTOELECTRIC MONITORING OF BODY EXTREMITIES
Albert K. Bond, Burlington, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Jul. 19, 1976, Ser. No. 706,876
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—29

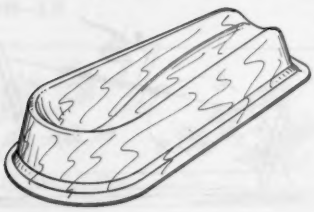
250,276
VALVE CAP FOR A VACUUM CURETTAGE VESSEL
Michael D. Thomas, Arab, Ala., and Francis E. Ryder, Barrington, Ill., assignors to Ryder International Corporation, Barrington, Ill.
Continuation-in-part of Ser. No. 639,648, Dec. 11, 1975, Pat. No. Des. 244,719. This application Feb. 28, 1977, Ser. No. 772,977
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—99



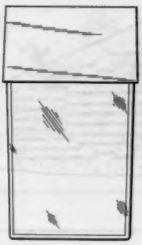
250,277
FASTENER FOR BANDAGES OR THE LIKE
Atsushi Takano, 65, Shimo-Yokowari, Fuji-shi, Shizuoka-ken, Japan
Filed Feb. 23, 1977, Ser. No. 771,251
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—99

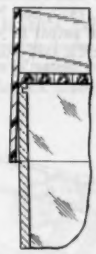
250,278
WALL OF AN ELEVATOR CAB
David J. Hesford, Belleville, N.J., and Robert W. Young, Massapequa Park, N.Y., assignors to Otis Elevator Company, New York, N.Y.
Filed Apr. 11, 1975, Ser. No. 567,206
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—37

250,279
SMOKING PIPE HOLDER
William H. Niesse, 1308 N. Capitol Ave., Indianapolis, Ind. 46202
Filed Jun. 27, 1977, Ser. No. 810,011
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—06

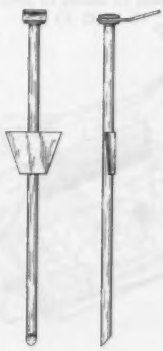


250,280
HERB CLEANER AND CARRYING BOX
Joel Waldman, Yonkers, N.Y., assignor to Curator Mfg. Co., Inc., Yonkers, N.Y.
Filed Apr. 22, 1977, Ser. No. 789,977
Term of patent 14 years
Int. Cl. D27—*99, 06;* D9—*03, 07*
U.S. Cl. D27—51

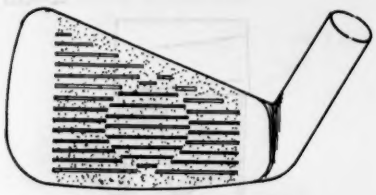




250,281
MOW-OVER ROTARY PET TIE-OUT STAKE
Gaylord V. Laukhuf, Antwerp, Ohio, assignor to Carolyn J. Laukhuf, Antwerp, Ohio
Filed Jan. 31, 1977, Ser. No. 763,875
Term of patent 14 years
Int. Cl. D23—*09*
U.S. Cl. D30—44

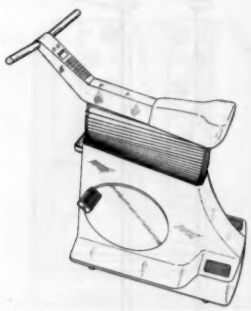


250,282
GOLF CLUB HEAD
Robert J. Brigham, Jr., 808 Dorken La., DeKalb, Ill. 60115, and Richard J. Semple, 8941 Zoellner Rd., Cincinnati, Ohio 45239
Filed Aug. 16, 1976, Ser. No. 714,515
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



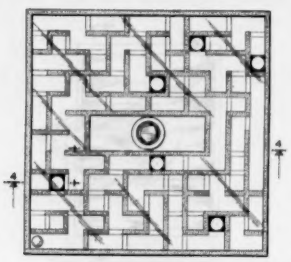
250,283
GOAL POST STRUCTURE
John H. Norton, N. Cedar Rd., Fairfield, Conn. 06430
Filed Feb. 24, 1977, Ser. No. 771,653
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 VV

250,284
EXERCISER
Dieter Borck, Mannweiler, Germany, assignor to Keiper Trainingsysteme GmbH & Co., Rockenhausen, Germany
Filed Sep. 30, 1976, Ser. No. 728,417
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1976, 174
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 K

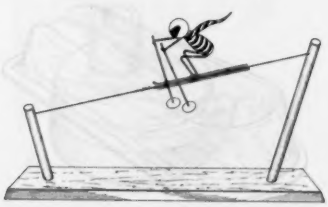


250,285
TOY BANK
Charles J. Tremonti, 27 Homesteader La., West Haven, Conn. 06516
Filed Feb. 8, 1977, Ser. No. 766,600
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D34—11 R

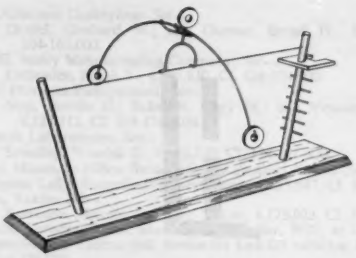
250,286
MAZE GAME PUZZLE OR SIMILAR ARTICLE
Harry Zelenko, 240 E. 61st St., New York, N.Y. 10036
Filed Dec. 27, 1976, Ser. No. 754,248
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 M



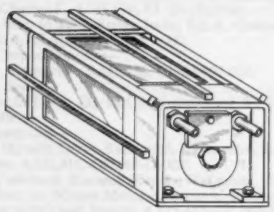
250,287
BALANCING SKIER TOY
Robert W. Horner, 4199 Massillon Rd., Box 222, Uniontown, Ohio 44685
Filed Mar. 31, 1977, Ser. No. 783,194
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 N



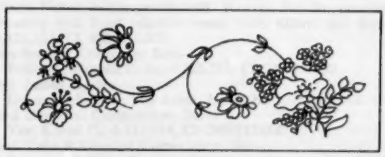
250,288
BALANCING ACROBAT TOY
Robert W. Horner, 4199 Massillon Rd., Box 222, Uniontown, Ohio 44685
Filed Apr. 12, 1977, Ser. No. 786,957
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 N



250,289
EXPLOSION PROOF HIGH INTENSITY DISCHARGE LAMP FOR MINES OR THE LIKE
Perfecto Dacal, Beckley, W. Va., assignor to Control Products, Inc., Beckley, W. Va.
Filed Dec. 14, 1976, Ser. No. 751,023
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 E

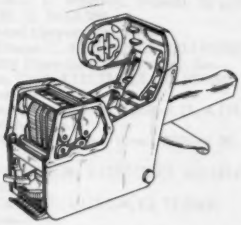


250,290
DECAL FOR CULINARY WARE
Estelle G. Rothstein, Corning, N.Y., assignor to Corning Glass Works
Filed Jan. 19, 1977, Ser. No. 760,642
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D59—2 R



250,291
DECAL FOR CULINARY WARE
Cynthia S. Gerow, Ballston Spa, N.Y., assignor to Corning Glass Works
Filed Feb. 7, 1977, Ser. No. 765,957
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D59—2 R

250,292
PORTABLE LABELER
Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato, Tokyo, Japan
Filed Jun. 16, 1976, Ser. No. 696,630
Claims priority, application Japan, Dec. 18, 1975, 50-49561
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D64—10



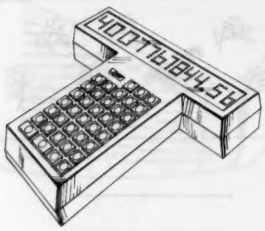
250,293
CALCULATOR CASING
William J. Lawrence, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Sep. 2, 1976, Ser. No. 719,787
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 B

250,294

CALCULATOR

Joseph Rose, 7 Ashland Pl., E. Northport, N.Y. 11731

Filed Jan. 17, 1977, Ser. No. 760,029
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 B

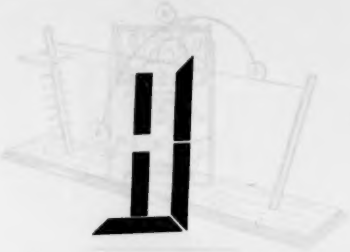


250,295

SEGMENTED ALPHABET CHARACTER V

William E. Miles, Fort Worth, Tex., assignor to General Dynamics Corporation, Fort Worth, Tex.

Division of Ser. No. 645,599, Dec. 31, 1975, abandoned. This application Dec. 23, 1977, Ser. No. 863,764
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D64—12 B



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF NOVEMBER, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Osakeyhtio: *See*—
Dorfel, Gerhard W.; and Gorner, Bernd D., 4,125,076, Cl. 104-165.000.

A. E. Staley Manufacturing Company: *See*—
Orthoefer, Frank T., 4,125,630, Cl. 426-104.000.

A P Products Incorporated: *See*—
Sipp, Steven O.; Schmidt, Gary M.; and Venaleck, John T., 4,125,313, Cl. 339-176.00M.

Abbott Laboratories: *See*—
Standley, Wendell E., 4,125,120, Cl. 134-126.000.

Abe, Masao, to Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.). Rangefinding mechanism. 4,125,847, Cl. 354-25.000.

Abe, Yukito: *See*—
Amemiya, Hiroshi; and Abe, Yukito, 4,125,023, Cl. 73-362.0AR.

Abels, Theodor; Reissl, Manfred; and Muller, Willi, to Linde Aktiengesellschaft. Lateral-shift device for fork-lift vehicles. 4,125,199, Cl. 214-730.000.

Ackeret, Peter, to Zyliss Zysset AG. Juice squeezer for citrus fruits. 4,125,064, Cl. 99-508.000.

Adam, Klaus, to SMG-Suddeutsche Maschinenbau GmbH. Hydraulic press. 4,125,010, Cl. 72-453.060.

Addressograph Multigraph Corporation: *See*—
Goodwin, E. L., 4,125,283, Cl. 294-87.00R.

Adler, Walter M., to Viking Jersey Equipment Ltd. Offshore pipe laying. 4,124,991, Cl. 405-166.000.

Advanced Textiles Exploitation AG: *See*—
Barbieri, Enrico, 4,124,923, Cl. 26-18.500.

Aeritalia S.p.A.: *See*—
Fitzgerald, James T.; and Bergman, Burton, 4,125,235, Cl. 244-129.500.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Audibert, Francoise; Lederer, Edgar; and Chedid, Louis, 4,125,603, Cl. 424-88.000.

Agley, William: *See*—
Lavigne, William J., Jr.; Agley, William; and Case, George M., 4,124,995, Cl. 62-224.000.

Ahern, Charles J.: *See*—
Bode, James D.; Wolber, William G.; Michaels, Paul A.; and Ahern, Charles J., 4,125,374, Cl. 23-232.00E.

Aimar, Michele, to ITW Fastex Italia, S.p.A. Connector for electrical apparatus. 4,125,312, Cl. 339-107.000.

Air Filter Corporation: *See*—
Philipp, Emmett J., 4,125,386, Cl. 55-493.000.

Airco, Inc.: *See*—
Hartsough, Larry D.; and McLeod, Paul S., 4,125,446, Cl. 204-192.00P.

Akisue, Osamu: *See*—
Katoh, Hiroshi; Onoe, Yasumitsu; Kawamura, Koichi; and Akisue, Osamu, 4,125,416, Cl. 148-12.00F.

Akiyama, Yoshinori; Kurami, Kenshi; Takeshita, Junichiro; and Furuya, Takeo, to Nissan Motor Company, Limited. Safety belt arrangement with a belt hanger. 4,125,277, Cl. 280-745.000.

Akzona Incorporated: *See*—
Hense, Karl-Hermann; Heb, Rudolf; and Zang, Thomas, 4,124,973, Cl. 57-207.000.
Taylor, Jimmy, 4,124,974, Cl. 57-339.000.
van der Burg, Willem J., 4,125,718, Cl. 544-145.000.

Albrecht, Klaus-Dieter: *See*—
Schubart, Rudiger; and Albrecht, Klaus-Dieter, 4,125,512, Cl. 260-42.140.

Albright, Jay D.: *See*—
McEvoy, Francis J.; and Albright, Jay D., 4,125,732, Cl. 560-62.000.
Trust, Ronald I.; McEvoy, Francis J.; and Albright, Jay D., 4,125,729, Cl. 560-9.000.

Alcon Laboratories, Inc.: *See*—
Newton, Barry N., 4,125,554, Cl. 260-455.00B.

Aldenhovel, Hans, to Compagnie Generale de Radiologie. Control system for X-ray apparatus. 4,125,773, Cl. 250-413.000.

Alfter, Franz; Breitscheidel, Hans-Ulrich; and Spielau, Paul, to Dynamit Nobel Aktiengesellschaft. Process for the production of a forming tool from reactive resins with fillers, and forming tool. 4,125,351, Cl. 425-403.000.

Allen-Bradley Company: *See*—
Pollnow, Harold J., Jr., 4,125,782, Cl. 307-35.000.

Allen, James H.: *See*—
Evans, Robert F.; and Allen, James H., 4,125,167, Cl. 175-65.000.

Allied Chemical Corporation: *See*—
Yee, Kwok C., 4,125,534, Cl. 260-315.000.

Allied Tube & Conduit Corporation: *See*—
Rogove, Arthur H.; and Hijuelos, Augusto H., 4,124,932, Cl. 29-527.400.

Alshuk, Thomas J., to Amtel, Inc. Rolling mill gauge control system. 4,125,004, Cl. 72-9.000.

Altman, Richard M.; and Badkar, Ravindra K., to Vivitar Corporation. Light mixing device. 4,125,315, Cl. 350-96.100.

Alumax, Inc.: *See*—
Stephens, Wilbur E., 4,125,364, Cl. 432-145.000.

Ambroise, Marc A. Apparatuses for distributing hot cooked dishes and installations equipped therewith. 4,125,205, Cl. 221-129.000.

Amemiya, Hiroshi; and Abe, Yukito, to Tokyo Shibaura Electric Co., Ltd. Temperature-measuring apparatus. 4,125,023, Cl. 73-362.0AR.

Amerace Corporation: *See*—
Basile, Peter A., 4,125,140, Cl. 151-69.000.
Vecchiotti, Camillo M., 4,125,187, Cl. 206-333.000.
Vecchiotti, Camillo M.; and Meenen, Raymond P., 4,125,424, Cl. 156-550.000.

American Can Company: *See*—
Klowak, Bernard G.; Pauls, Walter L.; and Vermillon, Frederick J., Jr., 4,125,659, Cl. 428-153.000.
Vosti, Donald C.; and Silverman, Alan, 4,125,632, Cl. 426-111.000.

American Cyanamid Company: *See*—
Gastrock, William H.; and Asato, Goro, 4,125,539, Cl. 260-332.20A.
Lindsley, John F., 4,125,591, Cl. 423-328.000.
Loffelman, Frank F.; and Cesark, Frank F., 4,125,557, Cl. 260-501.180.
Los, Marinus, 4,125,727, Cl. 548-302.000.
McEvoy, Francis J.; and Albright, Jay D., 4,125,732, Cl. 560-62.000.
Susi, Peter V., 4,125,518, Cl. 260-45.8NZ.
Trust, Ronald I.; McEvoy, Francis J.; and Albright, Jay D., 4,125,729, Cl. 560-9.000.

American Optical Corporation: *See*—
Holmes, Duane C., 4,125,772, Cl. 250-396.0ML.

American Safety Equipment Corporation: *See*—
Henderson, Cyril, 4,125,231, Cl. 242-107.000.

American Standard Inc.: *See*—
Olson, Paul E.; and Lyons, Michael D., 4,124,980, Cl. 60-700.000.

AMP Incorporated: *See*—
Grantiz, Richard F.; and Rose, William H., 4,125,309, Cl. 339-18.00P.
Shatto, Walter C., Jr., 4,125,137, Cl. 140-147.000.

Amtel, Inc.: *See*—
Alshuk, Thomas J., 4,125,004, Cl. 72-9.000.

An, Bunzai: *See*—
Tani, Akira; Yuasa, Yoshiyuki; Watanabe, Atsushi; An, Bunzai; Soya, Masataka; and Tanabe, Hiromi, 4,125,477, Cl. 252-301.10W.

Anahara, Meiji: *See*—
Arai, Yoshiyasu; Anahara, Meiji; Saka, Masanori; Kokubu, Tokio; and Takeuchi, Kunio, 4,124,972, Cl. 57-328.000.

Ancona, John A.: *See*—
Hierholzer, Frank J., Jr.; Ancona, John A.; and Shelton, Gerald L., 4,125,756, Cl. 219-121.0LM.

Andersson, Conny, to ASEA Aktiebolag. Electric arc furnace hearth connection. 4,125,737, Cl. 13-9.00R.

Andres, Ronald P.: *See*—
Vig, John R.; Hafner, Erich; and Andres, Ronald P., 4,125,086, Cl. 118-49.100.

Andrews, David M., to Aztec Machinery Company, Inc. Oven heat exchanger. 4,125,354, Cl. 431-11.000.

Andrillon, Monique: *See*—
Bugaut, Andree; and Andrillon, Monique, 4,125,601, Cl. 424-71.000.

Anglo-American Clays Corporation: *See*—
Nott, Alan J.; and Price, William M., 4,125,460, Cl. 209-8.000.

Antonen, Robert C., to Dow Corning Corporation. Method of improving crack resistance of siloxane molding compositions. 4,125,510, Cl. 260-37.0SB.

Antony, Kenneth C., to Cabot Corporation. Method of salvaging and restoring useful properties to used and retired metal articles. 4,125,417, Cl. 148-131.000.

Antos, George J., to UOP Inc. Dehydrogenation method and nonacidic multimetallic catalytic composite for use therein. 4,125,565, Cl. 260-668.00D.

Aoki, Nobuo: *See*—
Hidaka, Hiroyoshi; Matsumoto, Ikuo; Ito, Yoshiaki; and Aoki, Nobuo, 4,125,730, Cl. 560-37.000.

Apparatebau Rothemuhle Brandt & Kritzler: *See*—
Kritzler, Gerhard; Schluter, Siegfried H.; and Eckert, Paul, 4,125,149, Cl. 165-10.000.

Arai, Noritomo: *See—*
Kinoshita, Toshiharu; Shinoda, Yoshio; Oyamada, Takashi; Masuda, Mitsuo; and Arai, Noritomo, 4,125,749, Cl. 179-99.000.

Arai, Yoshiyasu; Anahara, Meiji; Saka, Masanori; Kokubu, Tokio; and Takeuchi, Kunio, to Toyo Bseki Kabushiki Kaisha. Process and apparatus for producing yarns. 4,124,972, Cl. 57-328.000.

Araujo, Roger J.; Borrelli, Nicholas F.; Chodak, Jan B.; Hares, George B.; Meiling, Gerald S.; and Seward, Thomas P., III, to Corning Glass Works. Photochromic glasses exhibiting dichroism, birefringence and color adaptation. 4,125,404, Cl. 106-54.000.

Araujo, Roger J.; Borrelli, Nicholas F.; Chodak, Jan B.; Hares, George B.; Meiling, Gerald S.; and Seward, Thomas P., III, to Corning Glass Works. Colored, dichroic, birefringent glass articles produced by optical alteration of additively-colored glasses containing silver and silver halides. 4,125,405, Cl. 106-54.000.

Arcamone, Federico; Bernardi, Luigi; Giardino, Pietro; and di Marco, Aurelio, to Societa' Farmaceutici Italia S.p.A. Daunosaminyl anthracyclinones and their use. 4,125,607, Cl. 424-180.000.

Arcamone, Federico; and Cassinelli, Giuseppe, to Societa' Farmaceutici Italia S.p.A. Protected pseudotrisaccharide intermediate for paromomycin and neomycin derivatives. 4,125,707, Cl. 536-17.000.

Arch Manufacturing Company: *See—*
Taylor, Edwin K.; Williams, James H.; and Kobos, Fred, 4,124,971, Cl. 57-9.000.

Arn, Fritz: *See—*
Buhlmann, Gerold P., 4,125,895, Cl. 364-483.000.

Arnston, Robert W.: *See—*
Cashel, Aloysius T.; Perna, Frank; Trussell, Gerald C.; D'Souza, Alfred C.; Karlin, Richard A.; Caruth, James R.; Van Ermen, Gary L.; Arnston, Robert W.; Comiskey, Gary F.; Borgens, Frederick R.; Kreft, Keith A.; Damm, Arthur; Sienaski, Dennis C.; Shepardson, Robert C.; Leung, Yam C.; and Jankowski, Thomas M., 4,125,894, Cl. 364-442.000.

Aronov, Alexandr R.: *See—*
Ryabenko, Evgeny A.; Bljum, Grigory Z.; Naida, Tatyana B.; Golub, Alexandr E.; Galchina, Natalya I.; Aronov, Alexandr R.; Semenova, Natalya F.; Raginskaya, Ljudmila K.; and Vonsovsky, Alexandr M., 4,125,596, Cl. 423-522.000.

Arthur D. Little, Inc.: *See—*
Martin, Peter G., 4,125,871, Cl. 364-900.000.

Arumugham, Rangaswamy, to GTE Sylvania Incorporated. AFC waveshaping circuit. 4,125,863, Cl. 358-195.000.

Asato, Goro: *See—*
Gastrock, William H.; and Asato, Goro, 4,125,539, Cl. 260-332.20A.

ASEA Aktiebolag: *See—*
Andersson, Conny, 4,125,737, Cl. 13-9.00R.

Ashburn, Paul J.: *See—*
Cochran, Phillip R.; and Ashburn, Paul J., 4,125,179, Cl. 192-53.00E.

Askew, John D., Jr.: *See—*
Chesluk, Ralph P.; Askew, John D., Jr.; and Henderson, Clifton C., 4,125,479, Cl. 252-33.600.

Assenheimer, Jurgen; and Brettschneider, Johannes, to Robert Bosch GmbH. Method and apparatus for controlling the operating mixture supplied to an internal combustion engine. 4,125,100, Cl. 123-124.00R.

Atasoy, Kaya; Weckwarth, Karl F.; and Reinhardt, Walter, to Ciba-Geigy Corporation. Process for the production of iodophors. 4,125,602, Cl. 424-80.000.

Atomic Energy of Canada Limited: *See—*
Strathdee, Graeme G., 4,125,598, Cl. 423-580.000.

Audibert, Francoise; Lederer, Edgar; and Chedid, Louis, to Agence Nationale de Valorisation de la Recherche (ANVAR). Stabilized water-in-oil emulsions and compositions. 4,125,603, Cl. 424-88.000.

Aughton, John E., to Crosfield Electronics Limited. Beam splitter. 4,125,864, Cl. 358-298.000.

Austen Bryars of London, Inc.: *See—*
Bryars, David J. J., 4,125,001, Cl. 66-9.00R.

Automix Keyboards, Inc.: *See—*
Hruby, John F.; McCleary, Rex; O'Hogan, Jerome M.; and Searle, Nathan H., 4,125,868, Cl. 364-900.000.

Axen, Udo F., to Upjohn Company, The. Certain 5,6-dihydro-prostacyclin analogs. 4,125,712, Cl. 542-421.000.

Ayerst, McKenna & Harrison Limited: *See—*
Bagli, Jehan F.; and Bogri, Tibor, 4,125,625, Cl. 424-305.000.

Aztec Machinery Company, Inc.: *See—*
Andrews, David M., 4,125,354, Cl. 431-11.000.

Baaso, George L. Twist lock for freight containers. 4,125,077, Cl. 105-366.00B.

Babcock & Wilcox Company, The: *See—*
Jabsen, Felix S., 4,125,435, Cl. 176-78.000.

Bach, Erik; and Ryaa, Jan, to Interlego A.G. Connector and bearing for swingably mounting rod. 4,124,949, Cl. 46-23.000.

Bachert, Karl R. Means for plating the inner surface of tubes. 4,125,447, Cl. 204-222.000.

Backus, Thomas R. Oil burner. 4,125,358, Cl. 431-168.000.

Bacon, Conrad G. Distillation system. 4,125,437, Cl. 202-117.000.

Bacskai, Robert, to Chevron Research Company. Catalyst for polymerization of 2-pyrrolidone. 4,125,523, Cl. 528-312.000.

Bader, Christian; and Schmidt, Helmut, to Deutsche Automobilgesellschaft mbH. Drive mechanism with an electric motor for trackless vehicles. 4,125,797, Cl. 318-270.000.

Badkar, Ravindra K.: *See—*
Altman, Richard M.; and Badkar, Ravindra K., 4,125,315, Cl. 350-96.100.

Badmin, John S.; and Jones, Richard F., to Shell Oil Company. Pesticidal cinnolines. 4,125,613, Cl. 424-250.000.

Baert, Victor R., to Pako Corporation. Paper feed cut off for photographic printer. 4,125,326, Cl. 355-74.000.

Bagdasarjanz, Felix; and Guanella, Gustav, to Patelhold Patentverwertungs- & Elektro Holding AG. Method for stabilizing the mean-frequency and modulation slope of a phase-keyed oscillator. 4,125,817, Cl. 332-19.000.

Bagli, Jehan F.; and Bogri, Tibor, to Ayerst, McKenna & Harrison Limited. Troponyl-oxamic acid derivatives. 4,125,625, Cl. 424-305.000.

Bagshaw, Norman E.; and McWhinnie, John, to Chloride Group Limited. Battery electrode structure. 4,125,690, Cl. 429-226.000.

Bailey, John M., to Caterpillar Tractor Co. Method for continuously maintaining a radiator free of debris. 4,125,147, Cl. 165-1.000.

Bailey, Victor S., to Grundy (Teddington) Limited. Coupling head having resilient liner for use with pressurized casks. 4,125,209, Cl. 222-400.700.

Bain, Lawrence J., to Rockwell International Corporation. Impact damping of printing cylinders. 4,125,073, Cl. 101-216.000.

Baker International Corporation: *See—*
Helmus, Sydney S., 4,125,165, Cl. 166-323.000.

Baker, Richard H., to Exxon Research & Engineering Co. High-power switching amplifier. 4,125,814, Cl. 330-251.000.

Bako, Lazlo, to Presto Lock Company, Division of Walter Kidde & Company, Inc. Turnbutton latch. 4,125,282, Cl. 292-336.000.

Bakun, Paul: *See—*
Porter, Clifford; and Bakun, Paul, 4,125,108, Cl. 126-271.000.

Baldwin, John J.; and Novello, Frederick C., to Merck & Co., Inc. Trifluoromethylimidazoles and a method for their preparation. 4,125,530, Cl. 546-167.000.

Baldwin, John J., to Merck & Co., Inc. Novel substituted pyridines, their preparation and pharmaceutical use. 4,125,618, Cl. 424-265.000.

Ball Brothers Research Corporation: *See—*
Pardee, Robert P., 4,125,668, Cl. 428-409.000.

Ballas, George C., Sr., to Weed Eater, Inc. Flexible string cutting device. 4,124,938, Cl. 30-276.000.

Balukin, Richard F.: *See—*
Worbois, Robert J.; and Balukin, Richard F., 4,125,292, Cl. 303-36.000.

Banyu Pharmaceutical Co., Ltd.: *See—*
Hidaka, Hiroyoshi; Matsumoto, Ikuo; Ito, Yoshiaki; and Aoki, Nobuo, 4,125,730, Cl. 560-37.000.

Barber, Thomas W.; and Proctor, Miles W., to Donovan Construction Company. Concrete pipe forming machine. 4,125,579, Cl. 264-32.000.

Barbieri, Enrico, to Advanced Textiles Exploitation AG. Apparatus for texturing yarn and textile fabric containing synthetic fibers. 4,124,923, Cl. 26-18.500.

Barmac Electronics: *See—*
McPherson, Ernest W.; and Barss, Jonn C., 4,125,824, Cl. 340-52.00D.

Barnett, Frank, to Expanded Metal Company Limited, The. Expanded metal. 4,124,925, Cl. 29-6.200.

Barron, Frank M. Positive adjust driving center. 4,125,042, Cl. 82-40.00R.

Barry, John N., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Range or time-delay determining subsystem for use in certain radar-like systems. 4,125,835, Cl. 343-13.00R.

Barss, Jonn C.: *See—*
McPherson, Ernest W.; and Barss, Jonn C., 4,125,824, Cl. 340-52.00D.

BASF Aktiengesellschaft: *See—*
Scholz, Herbert; and Gotsmann, Guenther, 4,125,559, Cl. 562-531.000.

BASF Wyandotte Corporation: *See—*
Elfers, Gunther H., 4,125,508, Cl. 260-33.20R.
Narayan, Thirumurti; and Cenker, Moses, 4,125,489, Cl. 521-136.000.
O'Brien, Edward F.; and Langdon, William K., 4,125,382, Cl. 44-51.000.
Patil, Arvind S.; and Weissman, Eugene Yehuda, 4,125,451, Cl. 204-296.000.

Basic Sciences, Inc.: *See—*
Fitzpatrick, Doug, 4,125,163, Cl. 166-314.000.

Basile, Peter A., to Amerace Corporation. Access panel fastener. 4,125,140, Cl. 151-69.000.

Batchelor, Phillip J.; Gray, Gerald A., Jr.; Laskowski, Kenneth W.; and Wilczek, Stephen P., to Xerox Corporation. Automatic duplex control system for a reproduction machine. 4,125,325, Cl. 355-26.000.

Bauer, Eric, to Caracteres S.A. Method for manufacturing a characters carrying aggregate for printing machine. 4,124,930, Cl. 29-407.000.

Baumann, Hans D., to Masoneilan International, Inc. Fixed and variable resistance fluid throttling apparatus. 4,125,129, Cl. 137-625.300.

Baumgarth, Manfred: *See—*
Radunz, Hans-Eckart; Orth, Dieter; Baumgarth, Manfred; Lissner, Reinhard; and Maisenbacher, Jurgen, 4,125,622, Cl. 424-276.000.

Bausch & Lomb Incorporated: *See—*
Clark, James A., 4,124,905, Cl. 3-13.000.

Bayer Aktiengesellschaft: *See—*
Beck, Gunther; and Heitzer, Helmut, 4,125,722, Cl. 544-334.000.
Beck, Gunther; and Heitzer, Helmut, 4,125,723, Cl. 544-334.000.
Burger, Klaus; Mausberg, Hans; and Tengler, Hubert, 4,125,464, Cl. 210-31.00C.

Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, 4,125,609, Cl. 424-200.000.
Pettelkau, Hans-Jurgen; Ehrig, Bodo; Nothen, Karl; and Rosahl, Dietrich, 4,125,697, Cl. 526-88.000.
Paar, Hubertus, 4,125,717, Cl. 544-102.000.
Schubart, Rudiger; and Albrecht, Klaus-Dieter, 4,125,512, Cl. 260-42.140.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Zelger, Werner; and Busch, Lothar, 4,125,150, Cl. 165-16.000.

Becht, Cletus A.: *See*—
White, John R.; Murray, Frank J.; and Becht, Cletus A., 4,125,660, Cl. 428-218.00A.

Beck, Gunther; and Heitzer, Helmut, to Bayer Aktiengesellschaft. Process for the preparation of tetrachloropyrimidine. 4,125,722, Cl. 544-334.000.

Beck, Gunther; and Heitzer, Helmut, to Bayer Aktiengesellschaft. Process for the preparation of tetrachloropyrimidine. 4,125,723, Cl. 544-334.000.

Becker, James R., to Kohner, Inc. Action toy. 4,124,950, Cl. 46-109.000.

Becker, Judith W., to Du Pont de Nemours, E. I., and Company. Adhesive composition. 4,125,522, Cl. 528-61.000.

Beckford, Murray D.; Hennen, Roy E.; and Wells, Van D., to Globe-Union Inc. Adjustable battery stacking spacer. 4,125,683, Cl. 429-121.000.

Beer, Frederick W.; Kresak, Fedor P.; and Kuev, Conio. Method and apparatus for placing flexible packages in containers. 4,124,967, Cl. 53-446.000.

Behrenz, Wolfgang: *See*—
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, 4,125,609, Cl. 424-200.000.

Bell, Duncan; Odell, Jack L.; Olson, David E.; and Peirce, Allen E., to Western Gear Corporation. Method and apparatus for adjusting the tension of an underwater pipeline. 4,124,990, Cl. 405-167.000.

Bell & Howell Company: *See*—
Boyer, Harold E., 4,125,254, Cl. 270-68.00A.

Bell Telephone Laboratories, Incorporated: *See*—
Cubbison, Richard J., Jr., 4,125,813, Cl. 330-104.000.
Davis, James A.; and Ooms, William J., 4,125,855, Cl. 357-45.000.
Di Salvo, Francis J., Jr.; and Murphy, Donald W., 4,125,687, Cl. 429-194.000.
Fulton, Alan W.; Ooms, William J.; and Reed, Ray A., 4,125,853, Cl. 357-36.000.
Goodall, William M., 4,125,744, Cl. 179-1.50R.
Mounts, Frank W.; Netravali, Arun N.; and Prasada, Birendra, 4,125,861, Cl. 358-133.000.
Nahabedian, Charles E.; VanOrnum, James H.; Wang, Tse-Lin; and Weiss, Carl D., 4,125,748, Cl. 179-18.0BD.
Netravali, Arun N.; and Rubinstein, Charles B., 4,125,856, Cl. 358-13.000.
O'Boyle, Leonard E.; and Torok, Gabor P., 4,125,743, Cl. 178-18.000.
Vratny, Frederick, 4,125,648, Cl. 427-305.000.

Beloit Corporation: *See*—
Hergert, Richard E.; and Sanford, Charles L., 4,125,429, Cl. 162-123.000.

Bemmels, Cyrus W.; Mumber, Richard A.; and Schirripa, Thomas J., to Johnson & Johnson. Container sealing tape. 4,125,665, Cl. 428-352.000.

Bendix Autolite Corporation: *See*—
Bode, James D.; Wolber, William G.; Michaels, Paul A.; and Ahern, Charles J., 4,125,374, Cl. 23-232.00E.

Benjamin, Louis: *See*—
Walser, Armin; Fryer, Rodney I.; and Benjamin, Louis, 4,125,726, Cl. 548-302.000.

Berclaz, Rene-Louis; and Fontannaz, Robert. Pedal mechanism. 4,125,239, Cl. 248-69.000.

Bergius, Rauno. Control system and method for loading of engine driven apparatus. 4,125,166, Cl. 172-1.000.

Bergman, Burton: *See*—
Fitzgerald, James T.; and Bergman, Burton, 4,125,235, Cl. 244-129.500.

Bernardi, Luigi: *See*—
Arcamone, Federico; Bernardi, Luigi; Giardino, Pietro; and di Marco, Aurelio, 4,125,607, Cl. 424-180.000.

Bernhardt, Richard P., to Sperry Rand Corporation. Automatic reel height control for a harvester header having a flexible cutterbar. 4,124,970, Cl. 56-10.200.

Besnard, Rene J. Press for squeezing juice from ligneous plants and material. 4,125,070, Cl. 100-116.000.

Bethlehem Steel Corporation: *See*—
Mino, George M.; and Dustin, Donald L., 4,125,679, Cl. 428-659.000.
Perfetti, Guido A.; and Darlington, Henry, 4,125,670, Cl. 428-626.000.

Bettermann, Dieter, to SAPCO Systemanalyse und Projektberatung GmbH. Apparatus for degassing and supplying plastic material to processing machines. 4,125,208, Cl. 222-152.000.

Betts, William L., to NCR Corporation. Cascaded recursive digital filter. 4,125,900, Cl. 364-724.000.

Beuscher, Clinton J.: *See*—
Tosswill, Christopher H.; and Beuscher, Clinton J., 4,125,776, Cl. 250-508.000.

Beutler, Helmut; and Lehmann, Joachim W., to Hoechst Aktiengesellschaft. Process for the level, isothermal high-temperature dyeing of hydrophobic synthetic fibers with disperse dyestuffs. 4,125,371, Cl. 8-176.000.

Bezold, Helmut, to Kraftwerk Union Aktiengesellschaft. Method of automatically filling nuclear fuel rod jacket tubes. 4,125,577, Cl. 264-0.500.

BFG Glassgroup: *See*—
Van Laethem, Robert, 4,125,391, Cl. 65-60.00D.

Bigliani, Umberto: *See*—
Di Nunzio, Vittorio; and Bigliani, Umberto, 4,125,015, Cl. 73-118.000.

Bio-Dynamics Inc.: *See*—
Stahl, Robert M., 4,124,965, Cl. 53-412.000.

Biotechnical Processes Limited: *See*—
Plaskett, Lawrence G., 4,125,634, Cl. 426-231.000.

Birch, Ralph W., to U.M.P. Plastics Limited. Closure cap. 4,125,201, Cl. 215-330.000.

Birka, John: *See*—
Manley, Chester W., 4,125,200, Cl. 215-246.000.

Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, to Hoechst Aktiengesellschaft. Process and additional devices of cylinder drying machines for the uniform drying of textiles. 4,124,941, Cl. 34-18.000.

Bissell, Inc.: *See*—
Rosendall, Henry J., 4,124,913, Cl. 15-42.000.

Black Clawson Company, The: *See*—
Phelps, Richard W., 4,125,428, Cl. 162-301.000.

Black, Robert P., to Isothermic Engineering & Research Limited. Pleater for forming compartments for a quilted fabric. 4,125,079, Cl. 112-262.000.

Blair, Bruce A., to Lenco, Inc. Device for teaching and evaluating a person's skill as a welder. 4,124,944, Cl. 35-13.000.

Bleriot, Alain: *See*—
Schapira, Joseph; Ruel, Jacques; and Bleriot, Alain, 4,125,575, Cl. 260-923.000.

Bliss, Robert A., to Champion International Corporation. Divided display carton and blank therefor. 4,125,185, Cl. 206-45.150.

Blize, Roy L.: *See*—
Dean, Michael F.; and Blize, Roy L., 4,125,646, Cl. 427-253.000.

Bljum, Grigory Z.: *See*—
Ryabenko, Evgeny A.; Bljum, Grigory Z.; Naida, Tatyana B.; Golub, Alexandr E.; Galchina, Natalya I.; Aronov, Alexandr R.; Semenova, Natalya F.; Raginskaya, Ljudmila K.; and Vonsovsky, Alexandr M., 4,125,596, Cl. 423-522.000.

Bloom, Stanley M.; Chiklis, Charles K.; and Kinsman, Gordon F., to Polaroid Corporation. Electrical cells and batteries and methods of making the same. 4,125,685, Cl. 429-122.000.

Blount, David H. Process for the production of polyester-silicate resinous products. 4,125,498, Cl. 260-18.00S.

Blount, David H. Process for the polymerization of allyl halides to form polyallyl alcohol. 4,125,694, Cl. 526-47.700.

Blount, David H. Process for the production of phenol silicate compounds and their condensation products. 4,125,703, Cl. 528-95.000.

Blum, Helmut; Gloxhuber, Christian; Heine, Christian; and Worms, Karl-Heinz, to Henkel Kommanditgesellschaft Auf Aktien (Henkel KGaA). Appetite curbing preparation containing an alginate and a diphosphonic acid. 4,125,608, Cl. 424-180.000.

Blume, Horst K.; and Erpel, Adolf. Agitator system. 4,125,335, Cl. 366-209.000.

Bode, James D.; Wolber, William G.; Michaels, Paul A.; and Ahern, Charles J., to Bendix Autolite Corporation. Method and apparatus for determining combustion mixture air/fuel ratio. 4,125,374, Cl. 23-232.00E.

Boehme, Robert E.; and Murphy, Clarence R., to Gulf Oil Corporation; and Champion International Corporation. Process for the manufacture of fibrils. 4,125,584, Cl. 264-142.000.

Boehringer Ingelheim GmbH: *See*—
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; and Hoefke, Wolfgang, 4,125,620, Cl. 424-273.00R.

Boeing Company, The: *See*—
Fitzgerald, James T.; and Bergman, Burton, 4,125,235, Cl. 244-129.500.
Krezak, John E.; and Matics, John R., 4,125,029, Cl. 74-13.000.

Bogachenko, Alexsey G.: *See*—
Medovar, Boris I.; Latash, Yury V.; Bogachenko, Alexsey G.; Kaganovsky, Gary P.; Leibenzon, Semen A.; Eltsov, Konstantin S.; Gabuev, Georgy K.; and Poticha, Zinoviy I., 4,125,145, Cl. 164-252.000.

Boger, Allen D., Jr.: *See*—
Hudspeth, Emmett L.; Richardson, Philip C.; Neathery, John L., Jr.; Dykstra, Jerald P.; Boger, Allen D., Jr.; Sims, William B., Jr.; Hunt, Glenn E.; and Quisenberry, Tony M., 4,125,111, Cl. 128-2.05T.

Boggs, Ray: *See*—
Hong, Sung D.; Boggs, Ray; and Takei, Shinzo, 4,125,088, Cl. 118-301.000.

Bogri, Tibor: *See*—
Bagli, Jehan F.; and Bogri, Tibor, 4,125,625, Cl. 424-305.000.

Bohren, Hans-Ueli: *See*—
Buhler, Marcel; Bohren, Hans-Ueli; Hodel, Theodore; and Wenner, Valentin, 4,125,527, Cl. 260-112.00R.

Boling, Norman L.; and Dube, George, to Owens-Illinois, Inc. Solid state laser having two output wavelengths. 4,125,816, Cl. 331-94.50F.

Bolton, Wilbur M.: *See*—
Conant, Louis A.; Bolton, Wilbur M.; and Wilson, James E., 4,125,640, Cl. 427-250.000.

Bonar & Bemis, Ltd.: *See*—
Wilson, Lowell A., 4,124,966, Cl. 53-452.000.

Bonnaterre, Raymond, to Saft-Societe des Accumulateurs Fixes et de Traction. Negative electrodes for electric cells. 4,125,688, Cl. 429-206.000.

Bordet, Philippe; and Le Mehaute, Alain, to Compagnie General d'Electricite. Sodium-sulphur electric cell. 4,125,682, Cl. 429-104.000.

Borg-Warner Corporation: *See*—
Grzesiak, Anthony J., 4,125,265, Cl. 277-152.000.
Kestner, Mark O.; and Krueger, Robert H., 4,125,152, Cl. 165-133.000.
Kuzel, Josef J., 4,125,280, Cl. 285-137.00R.
Roberts, Richard W., 4,125,180, Cl. 192-82.00T.

Borgens, Frederick R.: *See*—
Cashel, Aloysius T.; Perna, Frank; Trussell, Gerald C.; D'Souza, Alfred C.; Karlin, Richard A.; Caruth, James R.; Van Ermen, Gary L.; Arnston, Robert W.; Comiskey, Gary F.; Borgens, Frederick R.; Kreft, Keith A.; Damm, Arthur; Sienaski, Dennis C.; Shepardson, Robert C.; Leung, Yam C.; and Jankowski, Thomas M., 4,125,894, Cl. 364-442.000.

Bornstein, Joseph, to Choay S.A. Octapeptide useful for the treatment of diabetes. 4,125,606, Cl. 424-178.000.

Borrelli, Nicholas F.: *See*—
Araujo, Roger J.; Borrelli, Nicholas F.; Chodak, Jan B.; Hares, George B.; Meiling, Gerald S.; and Seward, Thomas P., III, 4,125,404, Cl. 106-54.000.
Araujo, Roger J.; Borrelli, Nicholas F.; Chodak, Jan B.; Hares, George B.; Meiling, Gerald S.; and Seward, Thomas P., III, 4,125,405, Cl. 106-54.000.

Boschan, Robert H., to Hughes Aircraft Company. Process for making nitroarylacetylenes and nitroarylaldehydes. 4,125,563, Cl. 260-645.000.

Botz, Hans D., to Volvo Car B.V. Forwardly pivoting bonnet or hood for a motor vehicle. 4,125,170, Cl. 180-69.00C.

Bourn, Ronald L., to British Petroleum Company Limited, The. Baffle. 4,125,361, Cl. 431-354.000.

Bow, Kenneth E., to Dow Chemical Company, The. Cable shielding tape and cable. 4,125,739, Cl. 174-36.000.

Boyer, Harold E., to Bell & Howell Company. Automated radial roll folder. 4,125,254, Cl. 270-68.00A.

Boyer, Ivan M. Infra-red heated spray paint booth. 4,125,366, Cl. 432-209.000.

Braid, Milton, to Mobil Oil Corporation. Lubricant compositions. 4,125,472, Cl. 252-32.500.

Brandl, Josef, to Peter Ilmberger KG, Maschinen -und Zahnradfabrik. Method for spraying processing fluid on internal surface of a green tire. 4,125,639, Cl. 427-233.000.

Brauer, Melvin: *See*—
Kroplinski, Thaddeus F.; and Brauer, Melvin, 4,125,545, Cl. 260-404.500.

Breidt, Peter, Jr.: *See*—
Weiner, Milton L.; Breidt, Peter, Jr.; and Higgins, Thomas W., 4,125,662, Cl. 428-213.000.

Breil, Heinz: *See*—
Ziegler, Karl; Breil, Heinz; Martin, Heinz; and Holzkamp, Erhard, 4,125,698, Cl. 526-159.000.

Breitscheidel, Hans-Ulrich: *See*—
Alfter, Franz; Breitscheidel, Hans-Ulrich; and Spielau, Paul, 4,125,351, Cl. 425-403.000.

Brennan, James A.; and Lucki, Stanley J., to Mobil Oil Corporation. Process of treating lubricating oils with acidified sorbent. 4,125,457, Cl. 208-254.00R.

Bretschneider, Hermann; Hueber, Herman P.; Louzil, Friedrich; Fischer, Karl; Jager, Lothar; and Sagan, Johann, to U.S. Philips Corporation. Magnetic position marker for a tape recorder using magnetically alignable particles for making the mark. 4,125,844, Cl. 346-74.100.

Brettschneider, Johannes: *See*—
Assenheimer, Jurgen; and Brettschneider, Johannes, 4,125,100, Cl. 123-124.00R.

Brewer, John C., to Garbalizer Corporation of America. Shredder and improvements therein. 4,125,228, Cl. 241-243.000.

Brigodiot, Maryvonne: *See*—
Cheradame, Herve M.; Garapon, Jacques H.; Guizard, Christian G.; and Brigodiot, Maryvonne, 4,125,692, Cl. 526-48.300.

Briscoe, Harry H. Solar heat augmented heating system and temperature responsive gable vent. 4,125,222, Cl. 237-1.00A.

Brissot, Jean-Jacques L. E., to U.S. Philips Corporation. Method of manufacturing flat tapes of crystalline silicon from a silicon melt by drawing a seed crystal of silicon from the melt flowing down the faces of a knife shaped heated element. 4,125,425, Cl. 156-617.00R.

Bristol-Myers Company: *See*—
Crast, Leonard B., Jr.; and Graham, Robert G., 4,125,716, Cl. 544-28.000.
Howell, Henry G., 4,125,724, Cl. 544-336.000.
Redl, George, 4,125,610, Cl. 424-211.000.
Samour, Carlos M.; and Vida, Julius A., 4,125,621, Cl. 424-275.000.
Standridge, Robert T., 4,125,538, Cl. 260-326.5CA.

British Nuclear Fuels Ltd.: *See*—
Grant, Albert E.; and Wainwright, Stanley, 4,125,443, Cl. 204-60.000.

British Petroleum Company Limited, The: *See*—
Bourn, Ronald L., 4,125,361, Cl. 431-354.000.

British Steel Corporation: *See*—
Peace, John, 4,125,191, Cl. 209-609.000.

Brock, Bill M., Jr., to NL Industries, Inc. Tubing hanger with fail-safe control passageway. 4,125,155, Cl. 166-97.000.

Brodie, Mary G.: *See*—
Stvan, Otto J.; and Brodie, Mary G., 4,125,678, Cl. 428-514.000.

Brooks, J. Clayton: *See*—
Wenstrom, Richard T.; Reinke, Theodore S.; Tolley, Calvert B.; and Brooks, J. Clayton, 4,124,920, Cl. 17-48.000.

Brooks, James G., Jr.; Maure, Douglas R.; and Meijer, Christoffel H., to Combustion Engineering, Inc. Drive mechanism nuclear reactor control rod. 4,125,432, Cl. 176-22.000.

Brooks, Louis E. Dental film carriage. 4,125,852, Cl. 354-322.000.

Brown, Boveri & Cie AG: *See*—
Pohl, Joachim, 4,125,794, Cl. 315-362.000.

Brown, Charles H.: *See*—
Wolfrey, Leslie L.; and Brown, Charles H., 4,125,082, Cl. 114-298.000.

Brown, Clayton D., to Raytheon Company. Microwave oven control circuit. 4,125,751, Cl. 219-10.55B.

Brown Company: *See*—
Lancelot, Harry B., III; and MacRobbie, Robert M., 4,124,962, Cl. 52-702.000.
Vander Lugt, Thomas, Jr., 4,125,633, Cl. 426-121.000.

Brown, Gaylord W., to Sweetheart Plastic, Inc. Mechanical die adjustment mechanism. 4,125,350, Cl. 425-381.000.

Bruhin, Alfred C.: *See*—
Wahl, Ralph E.; and Bruhin, Alfred C., 4,125,741, Cl. 174-120.0SC.

Brumlik, George C., to Ingrip Fasteners, Inc. Team lattice fibers. 4,125,666, Cl. 428-370.000.

Bryars, David J. J., to Austen Bryars of London, Inc. Multi-gauge knit fabric with inlay. 4,125,001, Cl. 66-9.00R.

Budai, Geza J.: *See*—
Sovari, Janos; and Budai, Geza J., 4,125,203, Cl. 220-258.000.

Buechè, Clifford J. Sheet metal former. 4,125,006, Cl. 72-169.000.

Bugaut, Andree; and Vandenbossche, Jean-Jacques, to L'Oreal. Metaphenylenediamines and dyeing compositions containing the same. 4,125,367, Cl. 8-11.000.

Bugaut, Andree; and Andrillon, Monique, to L'Oreal. Substituted nitroaminophenols, process for their preparation and dyeing compositions in which they are present. 4,125,601, Cl. 424-71.000.

Buhler, Marcel; Bohren, Hans-Ueli; Hodel, Theodore; and Wenner, Valentin, to Societe d'Assistance Technique S.A. pour Produits Nestle. Process for the recovery of proteins. 4,125,527, Cl. 260-112.00R.

Buhlmann, Gerold P., to Arn, Fritz. Maximum-power motor. 4,125,895, Cl. 364-483.000.

Bunker Ramo Corporation: *See*—
Hoppe, Paul P., Jr., 4,125,311, Cl. 339-97.00R.
Polonio, John D., 4,125,812, Cl. 328-162.000.

Burdyn, Ralph F.: *See*—
Waite, Jerry M.; Burdyn, Ralph F.; and Savins, Joseph G., 4,125,158, Cl. 166-273.000.

Burger, Klaus; Mausberg, Hans; and Tengler, Hubert, to Bayer Aktiengesellschaft. Method and apparatus for multiple development of thin-layer chromatography plates. 4,125,464, Cl. 210-31.00C.

Burleigh, John E.: *See*—
Uraneck, Carl A.; and Burleigh, John E., 4,125,481, Cl. 252-431.00C.

Burns, Oliver E.; and Day, Robert C. Rescue and transportation device. 4,124,908, Cl. 5-82.00R.

Burroughs Corporation: *See*—
Dimyan, Magid Y., 4,125,876, Cl. 365-3.000.

Busby, David E.: *See*—
Scheifley, John C.; Shields, Clark R.; and Busby, David E., 4,125,593, Cl. 423-481.000.

Busch, Lothar: *See*—
Zelger, Werner; and Busch, Lothar, 4,125,150, Cl. 165-16.000.

Bush, Bill R.; and Hornstein, Jack, to Preload Company, Inc. Prestressed concrete tank having seamed diaphragm joints securing adjacent precast concrete panels. 4,124,960, Cl. 52-583.000.

Bushnell, James D.; Glivicky, Alexandr P.; Leighton, Milton D.; and Sankey, Bruce M., to Exxon Research & Engineering Co. Simultaneous deasphalting-extraction process. 4,125,458, Cl. 208-309.000.

Butts, Earl E.: *See*—
Kennedy, Thomas E.; Butts, Earl E.; and Steelman, Melvin W., 4,124,996, Cl. 62-256.000.

Buzhinsky, Vladimir L.; Raschepkin, Konstantin E.; Dunjushkin, Mikhail G.; Lysogorsky, Gennady T.; Valeev, Rustem I.; Nisenbaum, Yakov A.; and Ikhsanov, Deviz F., to Vsesojuzny Nauchno-Issledovatelsky Institut Po Sboru, Podgotovke I Transportu Nefti I Nefteproduktov "Vniispteneft". Working tool of a machine for cleaning the outer surface of pipes. 4,124,914, Cl. 15-93.00R.

Byrd, James I.; and Kaminski, Elton G., to Stolle Corporation, The. Blank and draw apparatus with gap control. 4,125,009, Cl. 72-350.000.

Cabot Corporation: *See*—
Antony, Kenneth C., 4,125,417, Cl. 148-131.000.

Callingham, Martin, to Lever Brothers Company. Antiperspirant compositions. 4,125,600, Cl. 424-47.000.

Campbell, Larry E.; and Stookey, Stanley D., to Corning Glass Works. Method for making chemically durable silicate coatings. 4,125,651, Cl. 427-372.C0B.

Campbell, Robert W., to Phillips Petroleum Company. Aromatic sulfide/sulfone polymer production. 4,125,525, Cl. 528-388.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Barry, John N., 4,125,835, Cl. 343-13.00R.

Canada Square Management Ltd.: *See*—
Swiderski, Kazimierz, 4,124,998, Cl. 62-442.000.

Candea, Cornell, to Chrysler Corporation. Engine oil pump test assembly. 4,125,014, Cl. 73-49.700.
Cannon, John G., to Westinghouse Air Brake Company. Fluid pressure control valve device arranged for fail-safe operation. 4,125,294, Cl. 303-37.000.
Canon Kabushiki Kaisha: *See—*
Ito, Tadashi; Ito, Fumio; Nakamoto, Soichi; and Isobe, Yasuo, 4,125,848, Cl. 354-29.000.
Nakamoto, Soichi; Ito, Fumio; Isobe, Yasuo; and Ito, Tadashi, 4,125,846, Cl. 354-23.00D.
Shinoda, Nobuhiko; Sakurada, Nobuaki; Ito, Tadashi; Yamamichi, Masayoshi; Murakami, Hiroyasu; and Suzuki, Masayuki, 4,125,832, Cl. 340-347.0DD.
Canron, Inc.: *See—*
Stewart, John K., 4,125,075, Cl. 104-7.00B.
Caracteres S.A.: *See—*
Bauer, Eric, 4,124,930, Cl. 29-407.000.
Carey, Lee F., to Textron, Inc. Extendible/expandable nozzle for rocket engines and the like. 4,125,224, Cl. 239-265.430.
Carlson, Roger D., to United States of America, Energy. Temperature-dependent liquid metal flowrate control device. 4,125,221, Cl. 236-93.00R.
Carmosin, Richard J., to McNeil Laboratories, Incorporated. Preparation of pyrrole-2-acetates. 4,125,537, Cl. 260-326.200.
Caron, LaVerne A., to Chrysler Corporation. Circuit for multiplying two variables. 4,125,811, Cl. 328-160.000.
Carrier Corporation: *See—*
Harvey, Samuel E.; Whitehead, James S.; and Goranson, Paul L., 4,125,197, Cl. 214-310.000.
Lavigne, William J., Jr.; Agley, William; and Case, George M., 4,124,995, Cl. 62-224.000.
Liberman, Harvey W.; Goranson, Paul L.; Ratledge, R. Houston, Jr.; and Salyers, John C., 4,125,196, Cl. 214-152.000.
Carrigan, Robert J.; and Georgiades, Gregory, to Westvaco Corporation. Rotary cutting apparatus. 4,125,044, Cl. 83-356.300.
Cartsunis, Louis P.: *See—*
Johnson, Bruce N.; and Cartsunis, Louis P., 4,125,396, Cl. 71-70.000.
Caruth, James R.: *See—*
Cashel, Aloysius T.; Perna, Frank; Trussell, Gerald C.; D'Souza, Alfred C.; Karlin, Richard A.; Caruth, James R.; Van Ermen, Gary L.; Arnston, Robert W.; Comiskey, Gary F.; Borgens, Frederick R.; Kreft, Keith A.; Damm, Arthur; Sienaski, Dennis C.; Shepardson, Robert C.; Leung, Yam C.; and Jankowski, Thomas M., 4,125,894, Cl. 364-442.000.
Carver, George P.; Price, Frank C., Jr.; and Tyson, Thomas J., to Ultrasystems, Inc. Air field space heater for fog dispersal system. 4,125,223, Cl. 239-14.000.
Cascarano, Wayne A.: *See—*
Jukes, John A.; Pound, Thomas C.; and Cascarano, Wayne A., 4,125,645, Cl. 427-117.000.
Case, George M.: *See—*
Lavigne, William J., Jr.; Agley, William; and Case, George M., 4,124,995, Cl. 62-224.000.
Cashel, Aloysius T.; Perna, Frank; Trussell, Gerald C.; D'Souza, Alfred C.; Karlin, Richard A.; Caruth, James R.; Van Ermen, Gary L.; Arnston, Robert W.; Comiskey, Gary F.; Borgens, Frederick R.; Kreft, Keith A.; Damm, Arthur; Sienaski, Dennis C.; Shepardson, Robert C.; Leung, Yam C.; and Jankowski, Thomas M., to Sun Electric Corporation. Engine test and display apparatus. 4,125,894, Cl. 364-442.000.
Cassel, Knut E., to U.S. Philips Corporation. Broad band dipole antenna. 4,125,840, Cl. 343-807.000.
Cassinelli, Giuseppe: *See—*
Arcamone, Federico; and Cassinelli, Giuseppe, 4,125,707, Cl. 536-17.000.
Catano, Paul S., to United States of America, Navy. Aspect ratio and scan converter system. 4,125,862, Cl. 358-140.000.
Catano, Paul S.: *See—*
Stotts, Larry B.; and Catano, Paul S., 4,125,316, Cl. 350-96.130.
Caterpillar Tractor Co.: *See—*
Bailey, John M., 4,125,147, Cl. 165-1.000.
Hackett, David E., 4,125,030, Cl. 74-60.000.
Helm, Dennis R., 4,125,039, Cl. 74-874.000.
Shuler, Lucien B., 4,125,032, Cl. 74-96.000.
Wineburner, Ronald E., 4,125,034, Cl. 74-471.0XY.
Cecil E. Mayo Pty. Ltd.: *See—*
Mayo, John D.; and Kalnin, Laurence N., 4,125,115, Cl. 128-327.000.
CEL-U-DEX Corp.: *See—*
Chamberlin, Coleman R., 4,125,299, Cl. 312-184.000.
Cenker, Moses: *See—*
Narayan, Thirumurti; and Cenker, Moses, 4,125,489, Cl. 521-136.000.
Cesark, Frank F.: *See—*
Loffelman, Frank F.; and Cesark, Frank F., 4,125,557, Cl. 260-501.180.
Chalard, Jean-Claude: *See—*
Wasserman, Rene; Quaas, Joseph; Chalard, Jean-Claude; Noel, Leon; and Steine, Hans-Theo, 4,125,754, Cl. 219-121.00P.
Chamberlin, Coleman R., to CEL-U-DEX Corp. File divider and indexing apparatus. 4,125,299, Cl. 312-184.000.
Chambers, Ramon P.; Gordy, Robert S.; Sanders, David E.; and Morrison, Cameron E., to E-Systems, Inc. Transversal correlator error detector. 4,125,764, Cl. 235-302.000.
Chammas, Edmond D., to Weatherford/DMC, Inc. Chemical cutting apparatus and method for use in wells. 4,125,161, Cl. 166-297.000.
Champion International Corporation: *See—*
Bliss, Robert A., 4,125,185, Cl. 206-45.150.
Boehme, Robert E.; and Murphy, Clarence R., 4,125,584, Cl. 264-142.000.
Chan, Tsiu C.: *See—*
McKenny, Vernon G.; and Chan, Tsiu C., 4,125,854, Cl. 357-41.000.
Chang, Wen-Hsuan; Porter, Samuel, Jr.; and Wismer, Marco, to PPG Industries, Inc. Method of stabilizing the gloss retention of thermosetting resins containing hydroxyl groups. 4,125,570, Cl. 260-849.000.
Chedid, Louis: *See—*
Audibert, Francoise; Lederer, Edgar; and Chedid, Louis, 4,125,603, Cl. 424-88.000.
Chemie-Anlagenbau Bischofsheim GmbH: *See—*
Hilterhaus, Karl-Heinz, 4,125,693, Cl. 521-63.000.
Chen, Peter C.; Stewart, John K., Jr.; and Koo, Tuh-Kai, to NCR Corporation. Method of processing a semiconductor. 4,125,427, Cl. 156-657.000.
Chenoweth, James W. Reverse osmosis desalination apparatus and method. 4,125,463, Cl. 210-23.00H.
Cheradame, Herve M.; Garapon, Jacques H.; Guizard, Christian G.; and Brigodiot, Maryvonne, to Etat Francais represented by the "Delegue General pour l'Armement". Process for producing a macromolecular compound having a functional group at each end of the molecule. 4,125,692, Cl. 526-48.300.
Cherubim, Martin: *See—*
Josten, Friedrich; Cherubim, Martin; and Renkes, Karl-Heinz, 4,125,497, Cl. 260-18.00R.
Chesarek, Donald J., to International Business Machines Corporation. Display compressed image refresh system. 4,125,873, Cl. 364-900.000.
Chesluk, Ralph P.; Askew, John D., Jr.; and Henderson, Clifton C., to Texaco Inc. Oxidation inhibited lubricating oil. 4,125,479, Cl. 252-33.600.
Chevron Research Company: *See—*
Bacskai, Robert, 4,125,523, Cl. 528-312.000.
Freenor, Francis J., III; and Koerber, Barbara M., 4,125,397, Cl. 71-103.000.
Tamm, Paul W.; and Kuehler, Christopher W., 4,125,453, Cl. 208-11.00R.
Chicago Rawhide Manufacturing Company: *See—*
Gabrys, Kenneth F., 4,125,247, Cl. 249-66.00R.
Chiche, Rene, to Rufuss Establishment. Spherical junction element for composable display structures. 4,124,958, Cl. 52-285.000.
Chiklis, Charles K.: *See—*
Bloom, Stanley M.; Chiklis, Charles K.; and Kinsman, Gordon F., 4,125,685, Cl. 429-122.000.
Chilcote, Dennis D.: *See—*
Hansen, Barry J.; Stensrud, James C.; Zambrano, Adolfo R.; and Chilcote, Dennis D., 4,125,588, Cl. 423-150.000.
Chiocchio, Louis R.: *See—*
Dever, Gerald V., Jr.; and Chiocchio, Louis R., 4,125,138, Cl. 141-141.000.
Chisholm, James P., to Dow Chemical Company, The. Mixing apparatus. 4,125,331, Cl. 366-21.000.
Chiu, George T.; and Fredericks, Edward C., to International Business Machines Corporation. Resist image hardening process. 4,125,650, Cl. 427-337.000.
Chloride Group Limited: *See—*
Bagshaw, Norman E.; and McWhinnie, John, 4,125,690, Cl. 429-226.000.
Chloride, Incorporated: *See—*
Malinowski, William J., 4,125,779, Cl. 340-630.000.
Chmiel, Horst, to Linde Aktiengesellschaft. Method and apparatus for the deep cooling of liquid biological substances. 4,124,992, Cl. 62-74.000.
Choay S.A.: *See—*
Bornstein, Joseph, 4,125,606, Cl. 424-178.000.
Chodak, Jan B., to Corning Glass Works. Solar simulator. 4,125,775, Cl. 250-504.000.
Chodak, Jan B.: *See—*
Araujo, Roger J.; Borrelli, Nicholas F.; Chodak, Jan B.; Hares, George B.; Meiling, Gerald S.; and Seward, Thomas P., III, 4,125,404, Cl. 106-54.000.
Araujo, Roger J.; Borrelli, Nicholas F.; Chodak, Jan B.; Hares, George B.; Meiling, Gerald S.; and Seward, Thomas P., III, 4,125,405, Cl. 106-54.000.
Chromalloy American Corporation: *See—*
Dean, Michael F.; and Blize, Roy L., 4,125,646, Cl. 427-253.000.
Chrysler Corporation: *See—*
Candea, Cornell, 4,125,014, Cl. 73-49.700.
Caron, LaVerne A., 4,125,811, Cl. 328-160.000.
Platzer, George E., Jr., 4,125,093, Cl. 123-32.0EA.
Chu, Ge Y., to Wang Laboratories, Inc. Dot matrix printer. 4,125,336, Cl. 400-124.000.
Churchill, John W. Bilateral heater unit. 4,125,761, Cl. 219-544.000.
Ciavattoni, Anthony; Ujvary, Josef; and Gardella, John M., to Pennwalt Corporation. Panoramic dental x-ray machine. 4,125,774, Cl. 250-439.00P.
Ciba-Geigy AG: *See—*
Mollet, Herbert, 4,125,402, Cl. 96-53.000.
Ciba-Geigy Corporation: *See—*
Atasoy, Kaya; Weckwarth, Karl F.; and Reinhardt, Walter, 4,125,602, Cl. 424-80.000.

Dexter, Martin; and Steinberg, David H., 4,125,516, Cl. 260-45.80N.
Ramey, Chester E.; and Luzzi, John J., 4,125,517, Cl. 260-45.80N.
Roth, Martin, 4,125,398, Cl. 71-115.000.
Cii Honeywell Bull (Compagnie Internationale pour L'informatique): *See*—
Sauger, Guy G., 4,125,891, Cl. 364-200.000.
Cities Service Company: *See*—
Wolford, Lionel T., 4,125,535, Cl. 260-326.00N.
Clark, James A., to Bausch & Lomb Incorporated. Artificial intraocular lens system. 4,124,905, Cl. 3-13.000.
Clark, Kenneth K., to Geophysical Research Corporation. Gauge for remotely indicating the pressure of a subterranean formation. 4,125,027, Cl. 73-724.000.
Clark, Lowell E., to Motorola, Inc. Method of making high voltage semiconductor structure. 4,125,415, Cl. 148-1.500.
Clark, William J. R.: *See*—
Sarson, Alan E.; and Clark, William J. R., 4,125,857, Cl. 358-42.000.
Clem, Kenneth R.; Swan, George A.; and Dauber, Louis, to Exxon Research & Engineering Co. Process for suppression of catalyst deactivation and C_5+ liquid yield loss in a cyclic reforming unit. 4,125,454, Cl. 208-65.000.
Clingman, William H., Jr., to Precision Machine Products, Inc. Method of and means for accurately measuring the calorific value of combustible gases. 4,125,018, Cl. 73-190.0CV.
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Jones, Graham S., 4,125,334, Cl. 366-181.000.
Monks, Harry, 4,125,178, Cl. 192-18.00A.
Cobb, Raymond L., to Phillips Petroleum Company. Pyrolysis product of N-substituted-1-cyclohexene-1,2-dicarboximides. 4,125,536, Cl. 260-326.00C.
Coble, John T., to RCA Corporation. Spiked low-voltage aging of cathode-ray tubes. 4,125,306, Cl. 316-1.000.
Cochran, John P., to Kuhlman Corporation. High voltage electrical switch. 4,125,750, Cl. 200-144.00R.
Cochran, Michael J.; and Hamilton, Stephen P., to Texas Instruments Incorporated. Alphanumeric display system. 4,125,830, Cl. 340-336.000.
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Cochran, Phillip R.; and Ashburn, Paul J., to Dana Corporation. Synchronizing device having spring pin thrust members. 4,125,179, Cl. 192-53.00E.
Coloroll Limited: *See*—
Griffin, Gerald J. L., 4,125,495, Cl. 260-17.4ST.
Colura, Kenneth R.: *See*—
Haddad, Philip O.; and Colura, Kenneth R., 4,125,467, Cl. 210-83.000.
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Resnick, Jerome B.; and Combs, John W., 4,125,828, Cl. 340-146.3CA.
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Brooks, James G., Jr.; Maure, Douglas R.; and Meijer, Christoffel H., 4,125,432, Cl. 176-22.000.
Friedrichs, James R.; Snajdr, Edward A.; and Klaudinyi, Bela, 4,125,409, Cl. 106-66.000.
McGee, John K.; and Lane, Floyd J., 4,125,060, Cl. 92-59.000.
Comiskey, Gary F.: *See*—
Cashel, Aloysius T.; Perna, Frank; Trussell, Gerald C.; D'Souza, Alfred C.; Karlin, Richard A.; Caruth, James R.; Van Ermen, Gary L.; Arnston, Robert W.; Comiskey, Gary F.; Borgens, Frederick R.; Kreft, Keith A.; Damm, Arthur; Sienaski, Dennis C.; Shepardson, Robert C.; Leung, Yam C.; and Jankowski, Thomas M., 4,125,894, Cl. 364-442.000.
Compagnie Francaise de Produits Industriels: *See*—
Schapira, Joseph; Ruel, Jacques; and Bleriot, Alain, 4,125,575, Cl. 260-923.000.
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Bordet, Philippe; and Le Mehaute, Alain, 4,125,682, Cl. 429-104.000.
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Compton, Ralph M.; and Jenkins, Johnny W., Jr. Friction pad device. 4,125,132, Cl. 139-255.000.
Conant, Louis A.; Bolton, Wilbur M.; and Wilson, James E. Method of manufacturing defect free nickel armored laboratory and industrial brittleware. 4,125,640, Cl. 427-250.000.
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Kanzelberger, James C., 4,125,655, Cl. 428-67.000.
Continental Can Company, Inc.: *See*—
Mazur, Richard A.; and Martin, Ralph E., 4,125,831, Cl. 340-347.0AD.
Continental Group, Inc., The: *See*—
Moller, Jens Langhoff; and Kubis, Charles S., 4,125,080, Cl. 113-1.00R.
Continental Oil Company: *See*—
Leach, Bruce E., 4,125,736, Cl. 568-804.000.
Contraves Gorez Corporation: *See*—
Jones, Donald H., 4,125,800, Cl. 318-681.000.
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Coopersmith, Myron; and Jasion, Leo Z., deceased (by Jasion, Florence F., Administratrix), to Exxon Research & Engineering Co. Process for the manufacture of cosmetic quality isooctyl neodecanoate. 4,125,549, Cl. 260-425.000.
Corbin Gentry, Inc.: *See*—
Hanagan, Michael W., 4,125,285, Cl. 297-195.000.
Cornelius, Richard T.; and Erickson, Charles G., to McQuay-Perfex Inc. Beverage cooling bath. 4,124,994, Cl. 62-138.000.
Corning Glass Works: *See*—
Araujo, Roger J.; Borrelli, Nicholas F.; Chodak, Jan B.; Hares, George B.; Meiling, Gerald S.; and Seward, Thomas P., III, 4,125,404, Cl. 106-54.000.
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Campbell, Larry E.; and Stookey, Stanley D., 4,125,651, Cl. 427-372.00B.
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Powers, Dale R., 4,125,388, Cl. 65-3.00A.
Su, Yao-Sin; and Sugawara, Ken F., 4,125,594, Cl. 423-488.000.
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Courchesne, Luc. Portable utility bag. 4,125,212, Cl. 224-9.000.
Cowardin, Robert L.; and Laurer, George J., to International Business Machines Corporation. Label find method and circuit. 4,125,765, Cl. 235-463.000.
Cox, Kris E. Planetary milling machine. 4,125,057, Cl. 90-11.580.
Cracco, Francis J.; and Fanta, Wayne I., to Procter & Gamble Company, The. Adducts of bis(tri-alkyltin)oxide used as acaricides. 4,125,624, Cl. 424-288.000.
Crast, Leonard B., Jr.; and Graham, Robert G., to Bristol-Myers Company. Methoxymethyl esters of substituted imidazolidinyl-3-methyl-3-cephem-4-carboxylic acids. 4,125,716, Cl. 544-28.000.
Creamer, Adelene B. Absorbent pad for toilet base. 4,125,656, Cl. 428-80.000.
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Critchfield, Frank E.; Gerkin, Richard M.; and Hawker, Leslie E., to Union Carbide Corporation. Polymer/polyols from ethylene oxide content polyols. 4,125,505, Cl. 260-33.20R.
Cropley, Jean B., to Union Carbide Corporation. Process for making oxygenated carbon compounds. 4,125,553, Cl. 260-449.00R.
Crosfield Electronics Limited: *See*—
Aughton, John E., 4,125,864, Cl. 358-298.000.
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Donovan, Lawrence P.; Maguire, Eileen; and Kadison, Leon A., 4,125,649, Cl. 427-307.000.
Cuatrecasas, Pedro; and Parikh, Indu. Affinity chromatography of vibrio cholerae enterotoxin-ganglioside polysaccharide and the biological effects of ganglioside-containing soluble polymers. 4,125,492, Cl. 260-9.000.
Cubbison, Richard J., Jr., to Bell Telephone Laboratories, Incorporated. Operational amplifier decoupling circuit. 4,125,813, Cl. 330-104.000.
Culbertson, James F., to Envirotech Corporation. Steam atomizing burner. 4,125,360, Cl. 431-187.000.
Cummings, David G., to Newell Companies, Inc. Rail and glide assembly. 4,124,918, Cl. 16-93.00D.
Cushing, Vincent J., to Monitek, Inc. Probe type electromagnetic flow meter with debris shedding capability. 4,125,019, Cl. 73-194.0EM.
D'Agostino, Alfred. Protective installation. 4,125,886, Cl. 361-139.000.
Daicel Ltd.: *See*—
Murakami, Yasukazu; Kubo, Masayoshi; and Watanabe, Shoji, 4,125,521, Cl. 528-274.000.
Daimler-Benz Aktiengesellschaft: *See*—
Tiefenbacher, Eberhard, 4,125,344, Cl. 416-183.000.
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Matsumoto, Jun-ichi, 4,125,615, Cl. 424-251.000.
Damm, Arthur: *See*—
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Cochran, Phillip R.; and Ashburn, Paul J., 4,125,179, Cl. 192-53.00E.
Dantinne, Paul: *See*—
Lecloux, Andre; Kohler, Michel; and Dantinne, Paul, 4,125,543, Cl. 260-348.250.
Darlington, Henry: *See*—
Perfetti, Guido A.; and Darlington, Henry, 4,125,670, Cl. 428-626.000.
Darragh, John I.; and Rose, John B., to Imperial Chemical Industries Limited. Preparation of 4,4'-dihydroxydiphenylsulfones. 4,125,562, Cl. 260-607.0AR.

Dauber, Louis: *See*—
Clem, Kenneth R.; Swan, George A.; and Dauber, Louis, 4,125,454, Cl. 208-65.000.
Daunderer, Heinz: *See*—
Meiller, Hermann; and Daunderer, Heinz, 4,125,242, Cl. 248-399.000.
Davidson, Donald H.: *See*—
Huff, Ray V.; and Davidson, Donald H., 4,125,289, Cl. 299-4.000.
Davie, John H., Jr.; Hulick, Martin E.; and Verespy, Stephen J., Jr., to Sharp Corporation. Child-resistant blister package. 4,125,190, Cl. 206-532.000.
Davies, Peter K.; Stansfield, James F.; and Topham, Arthur, to Imperial Chemical Industries Limited. Dispersion of polycyclic vat-dye pigment with N,N'-disubstituted diaminostilbene sulfonic acid fluidizing agent. 4,125,413, Cl. 106-308.00Q.
Davies, Thomas J.: *See*—
French, Garland D.; and Davies, Thomas J., 4,125,041, Cl. 82-36.00R.
Davis, George B., Jr. Christmas tree lighting control. 4,125,781, Cl. 307-11.000.
Davis, Harry R.: *See*—
Stuart, Linden, Jr.; and Davis, Harry R., 4,125,422, Cl. 156-394.000.
Davis, James A.; and Ooms, William J., to Bell Telephone Laboratories, Incorporated. Integrated semiconductor crosspoint arrangement. 4,125,855, Cl. 357-45.000.
Davis, Roy F., Jr. Pressure and vacuum relief valve. 4,125,126, Cl. 137-493.100.
Day, Edward J.: *See*—
Mitchell, James A. H.; and Day, Edward J., 4,124,943, Cl. 35-8.00A.
Day, Robert C.: *See*—
Burns, Oliver E.; and Day, Robert C., 4,124,908, Cl. 5-82.00R.
Dayen, John. Game equipment support rack. 4,125,192, Cl. 211-14.000.
Dean, Albert, Jr.: *See*—
Dean, John H.; and Dean, Albert, Jr., 4,125,281, Cl. 292-148.000.
Dean, John H.; and Dean, Albert, Jr., to Deansteel Manufacturing Company. Door lock assembly. 4,125,281, Cl. 292-148.000.
Dean, Michael F.; and Blize, Roy L., to Chromalloy American Corporation. Diffusion coating of magnesium in metal substrates. 4,125,646, Cl. 427-253.000.
Dean, Ralph R. Paint spray booth composition. 4,125,476, Cl. 252-115.000.
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Dean, John H.; and Dean, Albert, Jr., 4,125,281, Cl. 292-148.000.
De Barba, Renzo: *See*—
Peruffo, Alessandro; and De Barba, Renzo, 4,125,067, Cl. 99-639.000.
DeBoer, Paul A. Megaphone-cup. 4,125,218, Cl. 229-1.50B.
De Brebisson, Michel, to U.S. Philips Corporation. Manufacture of semiconductor devices in which a doping impurity is diffused from a polycrystalline semiconductor layer into an underlying monocrystalline semiconductor material, and semiconductor devices thus manufactured. 4,124,934, Cl. 29-590.000.
DeForest, Sherman E.: *See*—
Varner, David O.; and DeForest, Sherman E., 4,125,268, Cl. 280-11.280.
De Graeve, Willy O.: *See*—
Delaunois, Claude L.; and De Graeve, Willy O., 4,125,560, Cl. 260-581.000.
Degueldre, Louis; and Nicolas, Edgard, to Solvay & Cie. Previous diaphragms for cells for the electrolysis of aqueous solutions of alkali metal halides. 4,125,450, Cl. 204-296.000.
DeHart, David A.; and Ridgell, James J., Jr., to Singer Company, The. Digitally shaped noise generating system. 4,125,898, Cl. 364-718.000.
De Jong, Aaldert J.: *See*—
Gray, Robin T.; and De Jong, Aaldert J., 4,125,484, Cl. 252-522.000.
Delaunois, Claude L.; and De Graeve, Willy O., to Universite Libre de Bruxelles Faculte des Sciences Appliquees. Aromatic amines synthesis process and products resulting from application of this process. 4,125,560, Cl. 260-581.000.
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Vienna, Paul C.; Den Herder, Marvin J.; and Zletz, Alex, 4,125,471, Cl. 252-31.000.
Denki Kagaku Kogyo Kabushiki Kaisha, Chuo-Kenkyusho: *See*—
Iwasaki, Takao; Hirano, Junji; and Matsumura, Hideki, 4,125,564, Cl. 260-655.000.
Denki Onkyo Company, Limited: *See*—
Masuda, Noboru, 4,125,821, Cl. 338-32.00R.
de Ruyter, Peter W. A. Method for making a meat analog. 4,125,635, Cl. 426-506.000.
Detroit Radiant Products Company: *See*—
Rozzi, Mario, 4,125,355, Cl. 431-71.000.
Deutsche Automobilgesellschaft mbH: *See*—
Bader, Christian; and Schmidt, Helmut, 4,125,797, Cl. 318-270.000.
Deutsche Gold-und Silber-Scheideanstalt Vormals Roessler: *See*—
Triebel, Wolfgang; Hari, Siegfried; Koert, Hubbert; and Evers, Fritz, 4,125,669, Cl. 428-412.000.
Deutsche Texaco Aktiengesellschaft: *See*—
Josten, Friedrich; Cherubim, Martin; and Renkes, Karl-Heinz, 4,125,497, Cl. 260-18.00R.
Dever, Gerald V., Jr.; and Chiocchio, Louis R., to Olin Corporation. Generation of polyurethane foam. 4,125,138, Cl. 141-141.000.
Deverell, Harry E.: *See*—
Kanne, John; and Deverell, Harry E., 4,125,260, Cl. 273-80.00R.
deVries, Egbert, to Quad Corporation. Odor control system. 4,125,589, Cl. 423-245.000.
Dexter, Martin; and Steinberg, David H., to Ciba-Geigy Corporation. Alkylthioalkanoyloxyalkyl and alkylthioalkyl substituted bis-hydantoin compounds. 4,125,516, Cl. 260-45.80N.
Dezawa, Shin-Ichiro; Sasazawa, Koji; Kitamoto, Tatsuji; and Yamazaki, Nobuo, to Fuji Photo Film Co., Ltd. Process for producing ferrogmagnetic iron oxide powder comprising a pre-treatment with a reducing agent. 4,125,474, Cl. 252-62.620.
Dhuyvetter, Henry J.; Engelder, Paul D.; and Simmons, Joseph C., to McDonnell Douglas Corporation. Redundant inertial measurement system. 4,125,017, Cl. 73-178.00R.
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Lewis, David L.; Schenke, Larry A.; Suchanski, Mary R.; and Franks, C. Richard, deceased, 4,125,449, Cl. 204-290.00F.
Diana, Guy D.; and Hinshaw, William B., Jr., to Sterling Drug Inc. Aryl substituted ketones. 4,125,541, Cl. 260-340.50R.
Diana, Guy D.; and Hinshaw, William B., Jr., to Sterling Drug Inc. Aryl substituted cycloalkanones. 4,125,714, Cl. 542-429.000.
Dietze, Wolfgang: *See*—
Reuschel, Konrad; Dietze, Wolfgang; and Rucha, Ulrich, 4,125,643, Cl. 427-9.000.
Dillon, Roy E., to Macfield Texturing. Apparatus for restarting a broken thread or yarn strand during a winding process. 4,125,229, Cl. 242-18.00R.
di Marco, Aurelio: *See*—
Arcamone, Federico; Bernardi, Luigi; Giardino, Pietro; and di Marco, Aurelio, 4,125,607, Cl. 424-180.000.
Dimyan, Magid Y., to Burroughs Corporation. Field access bubble lattice file device. 4,125,876, Cl. 365-3.000.
Di Nunzio, Vittorio; and Bigliani, Umberto, to Fiat Societa per Azioni. Process and device for determining the quantity of air inducted by an internal combustion engine. 4,125,015, Cl. 73-118.000.
Di Salvo, Francis J., Jr.; and Murphy, Donald W., to Bell Telephone Laboratories, Incorporated. Rechargeable nonaqueous cell with chalcogenide electrode. 4,125,687, Cl. 429-194.000.
Dr. Ralph M. Grant Engineering Consultants, Inc.: *See*—
Haskell, Richard E.; and Grant, Ralph M., 4,125,314, Cl. 350-3.600.
Doi, Yasuhiko: *See*—
Ikeda, Hiroshi; Doi, Yasuhiko; and Hayashi, Masamichi, 4,125,323, Cl. 355-8.000.
Dokoupil, Ludvik; Hrouda, Oldrich; and Zila, Josef, to Zavody presneho strojirenstvi, Gottwaldov, narodni podnik. Apparatus for automatic adjustment of the position of working mechanisms of shoe working devices. 4,124,912, Cl. 12-126.000.
Donovan Construction Company: *See*—
Barber, Thomas W.; and Proctor, Miles W., 4,125,579, Cl. 264-32.000.
Donovan, Lawrence P.; Maguire, Eileen; and Kadison, Leon A., to Crown City Plating. Pre-etch conditioning of polysulfone and other polymers for electroless plating. 4,125,649, Cl. 427-307.000.
Dooley, Richard A. Control mechanism for spray guns and the like. 4,125,035, Cl. 74-480.00R.
Dorfel, Gerhard W.; and Gorner, Bernd D., to A. Ahlstrom Osakeyhtio. Positioning device for carriages movable along a guide. 4,125,076, Cl. 104-165.000.
Doryokuro Kakunenryo Kaihatsu Jigyodan: *See*—
Kamei, Mitsuru; Osamu, Uno; Toru, Ogawa; Yoichiro, Ishii; and Masahiro, Satomi, 4,125,021, Cl. 73-304.00R.
Yamamoto, Ken, 4,125,130, Cl. 138-121.000.
Dour, John S.: *See*—
Rasmussen, Fred M.; and Dour, John S., 4,125,826, Cl. 340-63.000.
Dover Corporation: *See*—
Guertin, Robert W.; and Wood, Chester W., 4,125,139, Cl. 141-206.000.
Dow Chemical Company, The: *See*—
Bow, Kenneth E., 4,125,739, Cl. 174-36.000.
Chisholm, James P., 4,125,331, Cl. 366-21.000.
Crinkelmeyer, Oliver W.; and Morris, Earl F., 4,125,160, Cl. 166-293.000.
Haddad, Philip O.; and Colura, Kenneth R., 4,125,467, Cl. 210-83.000.
Mani, Inder; and Peters, James, 4,125,504, Cl. 260-29.70S.
Olstowski, Franciszek, 4,125,487, Cl. 521-137.000.
Reder-James, Brenda J.; and Ginter, Sally P., 4,125,369, Cl. 8-115.600.
Reineke, Charles E., 4,125,555, Cl. 260-456.00F.
Scheifley, John C.; Shields, Clark R.; and Busby, David E., 4,125,593, Cl. 423-481.000.
Sullivan, Edward J.; and Jones, Giffin D., 4,125,478, Cl. 252-316.000.
White, William L.; and Johnson, Francis;, 4,125,556, Cl. 260-464.000.
Dow Corning Corporation: *See*—
Antonen, Robert C., 4,125,510, Cl. 260-37.0SB.
Fenton, William N.; and Keil, Joseph W., 4,125,470, Cl. 252-27.000.
Kummins, Joel S.; and Smith, John C., Jr., 4,125,507, Cl. 260-31.4EP.
Speier, John L., 4,125,552, Cl. 260-448.80R.
Downer, John D.; and Ragoonanan, Dulcie, to Texaco Trinidad, Inc. Non-phytotoxic micronutrient compositions. 4,125,395, Cl. 71-27.000.
Downer, John D.; and Phillips, Clarence A. L., to Texaco Trinidad, Inc. Agricultural spray oil containing oxidation inhibitors. 4,125,400, Cl. 71-127.000.
Downey, David L.; Kennedy, James A.; and Neely, Liston E., to

Honeywell Information Systems Inc. Partial byte transmit apparatus for digital communication systems. 4,125,746, Cl. 179-15.0BA.

Downing, Roger S.; van Amstel, Jan; and Joustra, Annie H., to Shell Oil Company. Dimerization process catalyst. 4,125,483, Cl. 252-455.00R.

Drabing, Richard B.; Lam, Tim Y.; and Hoard, Charles Q., to Fluke Trendar Corporation. Automatic tester for microprocessor board. 4,125,763, Cl. 235-302.000.

Dravo Corporation: *See—*
Saxon, Arthur F., 4,125,379, Cl. 422-269.000.

Dresser Europe S.A.: *See—*
Parrott, George A.; and Norris, John B., 4,125,227, Cl. 241-186.00R.

Dresser Industries, Inc.: *See—*
Stratienko, Andrew, 4,125,790, Cl. 310-75.00D.

Drinkard, B. M.: *See—*
Theriot, Walter A.; Saucier, Steven D.; and Drinkard, B. M., 4,125,568, Cl. 260-681.500.

D'Souza, Alfred C.: *See—*
Cashel, Aloysius T.; Perna, Frank; Trussell, Gerald C.; D'Souza, Alfred C.; Karlin, Richard A.; Caruth, James R.; Van Ermen, Gary L.; Arnston, Robert W.; Comiskey, Gary F.; Borgens, Frederick R.; Kreft, Keith A.; Damm, Arthur; Sienaski, Dennis C.; Shepardson, Robert C.; Leung, Yam C.; and Jankowski, Thomas M., 4,125,894, Cl. 364-442.000.

Dube, George: *See—*
Boling, Norman L.; and Dube, George, 4,125,816, Cl. 331-94.50F.

Duchane, David V.: *See—*
Morman, Raymond A.; and Duchane, David V., 4,125,113, Cl. 128-260.000.

Duffy, James V., to United States of America, Navy. Phenylated carboxyquinoxalines. 4,125,725, Cl. 544-353.000.

Dugan, William P., to General Dynamics Corporation. Isolated bump circuitry on tape utilizing electroforming. 4,125,441, Cl. 204-12.000.

Dulux Australia Ltd.: *See—*
Graetz, Clive W.; and Leary, Bruce, 4,125,677, Cl. 428-500.000.

DuMont Electron Tubes & Devices Corporation: *See—*
Timan, Hans, 4,125,793, Cl. 313-95.000.

Dunjushkin, Mikhail G.: *See—*
Buzhinsky, Vladimir L.; Raschepkin, Konstantin E.; Dunjushkin, Mikhail G.; Lysogorsky, Gennady T.; Valeev, Rustem I.; Nisenbaum, Yakov A.; and Ikhsanov, Deviz F., 4,124,914, Cl. 15-93.00R.

Dunlop Limited: *See—*
Wildhagen, Birgitt I., 4,124,911, Cl. 9-33.000.

Du Pont de Nemours, E. I., and Company: *See—*
Becker, Judith W., 4,125,522, Cl. 528-61.000.
Glaeser, Hans H., 4,125,586, Cl. 423-84.000.
Gorman, John J., 4,125,491, Cl. 260-3.000.
Graham, Boynton, 4,125,700, Cl. 204-159.160.
West, William A., 4,125,412, Cl. 106-300.000.

Durraffourt, Jean F., to WABCO Westinghouse. Railway braking apparatus. 4,125,177, Cl. 188-62.000.

Dustin, Donald L.: *See—*
Mino, George M.; and Dustin, Donald L., 4,125,679, Cl. 428-659.000.

Dyckerhoff & Widmann Aktiengesellschaft: *See—*
Lippert, Erich, 4,125,580, Cl. 264-34.000.

Dygos, John H., to G. D. Searle. 20/22/23/24-Oxa-7-oxocholesterols and esters thereof. 4,125,544, Cl. 260-397.400.

Dykstra, Jerald P.: *See—*
Hudspeth, Emmett L.; Richardson, Philip C.; Neathery, John L., Jr.; Dykstra, Jerald P.; Boger, Allen D., Jr.; Sims, William B., Jr.; Hunt, Glenn E.; and Quisenberry, Tony M., 4,125,111, Cl. 128-2.05T.

Dynamit Nobel Aktiengesellschaft: *See—*
Alfter, Franz; Breitscheidel, Hans-Ulrich; and Spielau, Paul, 4,125,351, Cl. 425-403.000.
Redecker, Klaus; and Richtzenhain, Hermann, 4,125,561, Cl. 260-599.000.

E-Systems, Inc.: *See—*
Chambers, Ramon P.; Gordy, Robert S.; Sanders, David E.; and Morrison, Cameron E., 4,125,764, Cl. 235-302.000.

Eakes, Marion L., to M. L. Eakes Co. Ventilating system for industrial machines. 4,125,062, Cl. 98-115.0LH.

Eastman Kodak Company: *See—*
Frank, Lee F.; and Kaukeinen, Joseph Y., 4,125,319, Cl. 350-362.000.
Kaukeinen, Joseph Y.; and Michener, John R., 4,125,322, Cl. 355-4.000.
Phillips, Bobby M.; and Manning, Charles E., 4,124,924, Cl. 28-220.000.
Tang, Ching W.; Marchetti, Alfred P.; and Young, Ralph H., 4,125,414, Cl. 136-89.0NB.

Ebert, Claus, to ISOPOL A.G. Collapsible cupboard. 4,125,304, Cl. 312-257.0SM.

Ebisch, Wolfgang. Device for exerting back-pull on the heddles of Jacquard looms. 4,125,135, Cl. 139-456.000.

Eckardt, Peter, to Hoechst Aktiengesellschaft. Article and process for the manufacture of a carrier web. 4,125,663, Cl. 428-288.000.

Eckel Industries, Inc.: *See—*
Kochis, August J., 4,124,955, Cl. 49-237.000.

Eckert, Paul: *See—*
Kritzler, Gerhard; Schluter, Siegfried H.; and Eckert, Paul, 4,125,149, Cl. 165-10.000.

EDC Inc.: *See—*
Sasadi, John, 4,125,195, Cl. 214-41.00R.

Edwards, Robert B.: *See—*
Lehoczky, Kenneth A.; and Edwards, Robert B., 4,125,016, Cl. 73-139.000.

Effron, Edward, to Exxon Research & Engineering Co. Integrated coal liquefaction process. 4,125,452, Cl. 208-8.000.

Ehrenreich Photo-Optical Industries, Inc.: *See—*
Handsman, Frederic B., 4,125,211, Cl. 224-5.00V.

Ehrig, Bodo: *See—*
Pettelkau, Hans-Jurgen; Ehrig, Bodo; Nothen, Karl; and Rosahl, Dietrich, 4,125,697, Cl. 526-88.000.

Eibner, Robert: *See—*
Kohl, Wilhelm; Eibner, Robert; Nolle, Hans-Heinrich; Schneider, Alfred; and Moldovany, Nikolaus-Johann, 4,125,393, Cl. 71-3.000.

Eichler, Horst. Drive for submerged floating bodies. 4,125,083, Cl. 115-14.000.

Eige, John J.; Patel, Arvind M.; Roberts, Spencer D.; and Stedman, David, to International Business Machines Corporation. Tape motion control for reel-to-reel drive. 4,125,881, Cl. 360-50.000.

Elder, Michael A.: *See—*
Price, Raymond R.; and Elder, Michael A., 4,125,194, Cl. 214-17.0DB.

Electric Power Research Institute, Inc.: *See—*
Rabinowitz, Mario, 4,125,742, Cl. 174-211.000.

Electrical Instrumentation Co. Ltd.: *See—*
Schild, Felix, 4,125,330, Cl. 356-416.000.

Elektro-Physik: *See—*
Steingroever, Erich A., 4,125,807, Cl. 324-230.000.

Elfers, Gunther H., to BASF Wyandotte Corporation. Method of making a flocculant composition. 4,125,508, Cl. 260-33.20R.

Elliott Brothers (London) Limited: *See—*
Sarson, Alan E.; and Clark, William J. R., 4,125,857, Cl. 358-42.000.

Elliott, John: *See—*
Stingl, Hans A.; and Elliott, John, 4,125,368, Cl. 8-42.00B.

Elmeg Elektro-Mechnik GmbH: *See—*
Reuting, Hans W., 4,125,887, Cl. 361-331.000.

Eltra Corporation: *See—*
Miele, Raymond D., Jr., 4,124,931, Cl. 29-407.000.

Eltsov, Konstantin S.: *See—*
Medovar, Boris I.; Latash, Yury V.; Bogachenko, Alexsey G.; Kaganovsky, Gary P.; Leibenzon, Semen A.; Eltsov, Konstantin S.; Gabuev, Georgy K.; and Poticha, Zinoviy I., 4,125,145, Cl. 164-252.000.

Elward, Michael P.; and Mong, William K., to Westinghouse Air Brake Company. Vented ball-type cut-out cock. 4,125,128, Cl. 137-596.000.

Embree, Milo J., to Lawrence Peska Associates, Inc. Attachment for paint cans. 4,125,210, Cl. 222-570.000.

EMC Technology, Inc.: *See—*
Schilling, William A., 4,125,308, Cl. 339-17.0LC.

Emerson Electric Co.: *See—*
Henton, Paul V.; and Fait, Roger J., 4,125,469, Cl. 210-446.000.
Hierholzer, Frank J., Jr.; Ancona, John A.; and Shelton, Gerald L., 4,125,756, Cl. 219-121.0LM.

EMI Limited: *See—*
Hounsfield, Godfrey N.; and McLean, Donald F., 4,125,858, Cl. 358-82.000.

Engelder, Paul D.: *See—*
Dhuyvetter, Henry J.; Engelder, Paul D.; and Simmons, Joseph C., 4,125,017, Cl. 73-178.00R.

Engen, Anders. Bag for vacuum cleaners. 4,125,219, Cl. 229-53.000.

Envirotech Corporation: *See—*
Culbertson, James F., 4,125,360, Cl. 431-187.000.

Erickson, Charles G.: *See—*
Cornelius, Richard T.; and Erickson, Charles G., 4,124,994, Cl. 62-138.000.

Erickson, Erick E., to Marvin Glass & Associates. Game with elastic tethered missiles. 4,125,262, Cl. 273-101.000.

Erickson, Robert W., Jr.: *See—*
Erickson, Robert W., Sr.; and Erickson, Robert W., Jr., 4,125,882, Cl. 360-78.000.

Erickson, Robert W., Sr.; and Erickson, Robert W., Jr., to PerSci, Inc. Disc file system with improved seek control. 4,125,882, Cl. 360-78.000.

Ernst, Frederick T.; and Klay, Frank, to Ernst, Frederick T. Chain saw servicing kit. 4,125,207, Cl. 222-130.000.

Ernst, Herbert. Staircase with small base area. 4,125,175, Cl. 182-194.000.

Erpel, Adolf: *See—*
Blume, Horst K.; and Erpel, Adolf, 4,125,335, Cl. 366-209.000.

Erwin, Robert C., to NET Systems Inc. Apparatus for determining stress in nickel and titanium alloyed materials. 4,125,771, Cl. 250-277.00R.

Erwin, Samuel F. Solar oven. 4,125,109, Cl. 126-270.000.

Eskeli, Michael. Refrigeration machine. 4,124,993, Cl. 62-86.000.

Etat Francais represented by the "Delegue General pour l'Armement": *See—*
Cheradame, Herve M.; Garapon, Jacques H.; Guizard, Christian G.; and Brigodiot, Maryvonne, 4,125,692, Cl. 526-48.300.

Evans, Robert F.; and Allen, James H., to Smith International, Inc. Big hole bit. 4,125,167, Cl. 175-65.000.

Evers, Fritz: *See—*
Triebel, Wolfgang; Hari, Siegfried; Koert, Hubbert; and Evers, Fritz, 4,125,669, Cl. 428-412.000.

EVG Entwicklungs-u. Verwertungs-GmbH.: *See—*
Ritter, Klaus; Jahrbacher, Gerhard; and Ritter, Gerhard, 4,125,753, Cl. 219-56.000.

Expanded Metal Company Limited, The: *See—*
Barnett, Frank, 4,124,925, Cl. 29-6.200.

Exxon Research & Engineering Co.: *See—*
Baker, Richard H., 4,125,814, Cl. 330-251.000.
Bushnell, James D.; Glivicky, Alexandr P.; Leighton, Milton D.; and Sankey, Bruce M., 4,125,458, Cl. 208-309.000.
Clem, Kenneth R.; Swan, George A.; and Dauber, Louis, 4,125,454, Cl. 208-65.000.
Coopersmith, Myron; and Jasion, Leo Z., deceased, 4,125,549, Cl. 260-425.000.
Effron, Edward, 4,125,452, Cl. 208-8.000.
Li, Norman N., 4,125,461, Cl. 210-22.00R.
Lundberg, Robert D.; and Makowski, Henry S., 4,125,506, Cl. 260-30.60R.
Shropshire, Joseph A.; and Tsien, Hsue C., 4,125,680, Cl. 429-4.000.

Ezekoye, Levi I.; and Raftis, Spiros G., to Ezekoye, Levi I., a part interest. Pinch valve construction. 4,125,125, Cl. 137-315.000.

Ezis, Andre; and Schuldies, John J., to Ford Motor Company. Method of forming a silicon nitride article. 4,125,592, Cl. 423-344.000.

F. L. Smidth & Co.: *See—*
Hansen, Dan S., 4,125,363, Cl. 432-106.000.

Fait, Roger J.: *See—*
Henton, Paul V.; and Fait, Roger J., 4,125,469, Cl. 210-446.000.

Falkiewicz, Maria S. Portable household file. 4,125,303, Cl. 312-244.000.

Fanta, Wayne I.: *See—*
Cracco, Francis J.; and Fanta, Wayne I., 4,125,624, Cl. 424-288.000.

Far-Mar-Co, Inc.: *See—*
Rao, Ganta V.; and Shoup, Floyd K., 4,125,528, Cl. 260-112.00G.

Fellows Corporation: *See—*
Tlaker, Erich; and Haseltine, Harold G., 4,125,056, Cl. 90-7.000.

Fenton, William N.; and Keil, Joseph W., to Dow Corning Corporation. Band-ply lubricant concentrates. 4,125,470, Cl. 252-27.000.

Fiat Societa per Azioni: *See—*
Di Nunzio, Vittorio; and Bigliani, Umberto, 4,125,015, Cl. 73-118.000.

Fields, Reuben T. Extrusion apparatus. 4,125,333, Cl. 366-79.000.

Fifth Patroy Proprietary Limited: *See—*
Lukey, Leonard F., 4,125,244, Cl. 248-475.00B.

Finsterwalder, Gerhard: *See—*
Tholen, Paul; and Finsterwalder, Gerhard, 4,124,979, Cl. 60-599.000.

Firmenich SA: *See—*
Rossi, Jean E., 4,125,629, Cl. 426-2.000.

Fischell, Robert E., to Johns Hopkins University, The. Human tissue stimulation electrode structure. 4,125,116, Cl. 128-404.000.

Fischer, George J. Golf ball retrieval apparatus. 4,125,230, Cl. 242-54.00R.

Fischer, Karl: *See—*
Bretschneider, Hermann; Hueber, Herman P.; Louzil, Friedrich; Fischer, Karl; Jager, Lothar; and Sagan, Johann, 4,125,844, Cl. 346-74.100.

Fischer, Stefan; and Scharrenbroich, Helmut. Method for the further conveying of the hollow articles ejected by hollow article blow-moulding machines. 4,125,583, Cl. 264-98.000.

Fisons Limited: *See—*
Parsons, John H., 4,125,617, Cl. 424-263.000.

Fitzgerald, James T.; and Bergman, Burton, to Boeing Company, The; and Aeritalia S.p.A. Apparatus for opening an aircraft door and for arming and disarming an escape slide deploying mechanism. 4,125,235, Cl. 244-129.500.

Fitzpatrick, Doug, to Basic Sciences, Inc. Method and system for controlling well bore fluid level relative to a down hole pump. 4,125,163, Cl. 166-314.000.

Fleck, Raymond N., to Union Oil Company of California. Method of removing hydrogen sulfide from gas. 4,125,597, Cl. 423-573.00R.

Fleischer, Donald W., to Veeder Industries Inc. Rotary electromagnetic indicator system. 4,125,762, Cl. 235-92.0FL.

Fleischmann, Martin; Jansson, Robert E. W.; and Marshall, Rodney J., to National Research Development Corporation. Electrochemical cells and methods of electrolysis. 4,125,439, Cl. 204-1.00R.

Flinsenberg, Christiaan F. W.: *See—*
Spiertz, Elisabeth J.; Flinsenberg, Christiaan F. W.; and van Beek, Leendert K. H., 4,125,401, Cl. 96-49.000.

Fluke Trendar Corporation: *See—*
Drabing, Richard B.; Lam, Tim Y.; and Hoard, Charles Q., 4,125,763, Cl. 235-302.000.

Fogden, Michael F.: *See—*
Harris, John D.; Fogden, Michael F.; and Mead, Graham E., 4,125,169, Cl. 180-6.500.

Fohl, Artur, to Repa Feinstanzwerk GmbH. Safety device protecting roller blinds against unrolling. 4,125,142, Cl. 160-291.000.

Fontannaz, Robert: *See—*
Berclaz, Rene-Louis; and Fontannaz, Robert, 4,125,239, Cl. 248-69.000.

Ford Motor Company: *See—*
Ezis, Andre; and Schuldies, John J., 4,125,592, Cl. 423-344.000.

Forster, Franz, to Linde Aktiengesellschaft. Axial piston machine for adjustable stroke. 4,125,058, Cl. 91-506.000.

Fowler, T. Kenneth, to United States of America, Energy. Tandem mirror plasma confinement apparatus. 4,125,431, Cl. 176-3.000.

Frank, Lee F.; and Kaukeinen, Joseph Y., to Eastman Kodak Company. Active light control device. 4,125,319, Cl. 350-362.000.

Franke, Johannes; Kessler, Kurt; Kuhne, Ulrich; Sauerbier, Heinz; Schneider, Kurt; and Unbehaun, Karl, to VVB Haushalts- und Verpackungsglas. Vessel for salt melts, particularly for modifying the properties of objects of glass, vitrocrystalline material or stoneware. 4,125,154, Cl. 165-169.000.

Franks, C. Richard, deceased: *See—*
Lewis, David L.; Schenke, Larry A.; Suchanski, Mary R.; and Franks, C. Richard, deceased, 4,125,449, Cl. 204-290.00F.

Fredericks, Edward C.: *See—*
Chiu, George T.; and Fredericks, Edward C., 4,125,650, Cl. 427-337.000.

Freenor, Francis J., III; and Koerber, Barbara M., to Chevron Research Company. O-Sulfonyl-alpha-halo-2,6-dihalobenzaldoximes. 4,125,397, Cl. 71-103.000.

French, Garland D.; and Davies, Thomas J. Tool holder construction. 4,125,041, Cl. 82-36.00R.

French, Park; and Conaway, William H., to Sterndent Corporation. Tristimulus colorimeter. 4,125,329, Cl. 356-405.000.

Friedrichs, James R.; Snajdr, Edward A.; and Klaudinyi, Bela, to Combustion Engineering, Inc. High alumina-chromia plastic refractory mix. 4,125,409, Cl. 106-66.000.

Fries, William: *See—*
Schoenenberger, Karl A.; and Fries, William, 4,125,550, Cl. 260-428.000.

Fromel, Gustav; Suchy, Peter; and Ulrych, Gerhard, to Kraftwerk Union Aktiengesellschaft. Nuclear reactor-fuel element. 4,125,434, Cl. 176-76.000.

Fromknecht, Charles T., to Singer Company, The. Vacuum cleaner condition indicator and safety device. 4,124,916, Cl. 15-339.000.

Fryer, Rodney I.: *See—*
Walser, Armin; Fryer, Rodney I.; and Benjamin, Louis, 4,125,726, Cl. 548-302.000.

Fuji Photo Film Co., Ltd.: *See—*
Dezawa, Shin-Ichiro; Sasazawa, Koji; Kitamoto, Tatsuji; and Yamazaki, Nobuo, 4,125,474, Cl. 252-62.620.
Ikenoue, Shinpei; Katsuyama, Harumi; and Masuda, Takao, 4,125,403, Cl. 96-114.100.
Kamio, Takayoshi; and Miyamoto, Akio, 4,125,636, Cl. 427-150.000.
Ohnishi, Masahiro; Oono, Hiroshi; and Tozaki, Katutosi, 4,125,842, Cl. 346-1.000.

Fuji Photo Optical Co., Ltd.: *See—*
Suzuki, Masane; Suzuki, Kiyoshi; and Yasuda, Kenji, 4,125,025, Cl. 73-655.000.

Fuji Toyuki Kabushiki Kaisha: *See—*
Hosaka, Yukio; Matsui, Kunio; and Yamamoto, Tomio, 4,125,889, Cl. 362-253.000.

Fujimoto, Kazumi; and Iribe, Toshio, to Sony Corporation. Tape cassette case. 4,125,189, Cl. 206-387.000.

Fujino, Junichi: *See—*
Ikebata, Shigeki; Fujino, Junichi; and Miyazaki, Hideto, 4,125,795, Cl. 315-368.000.

Fujita, Masami; and Gunshi, Hirokazu, to Konishiroku Photo Industry Co., Ltd. Camera attached with device for preventing erroneous actions when the camera is not in use. 4,125,850, Cl. 354-204.000.

Fujitsu Limited: *See—*
Inayoshi, Katsuyuki; and Monma, Yoshinobu, 4,125,426, Cl. 156-656.000.

Fukuda, Shigeru; Narita, Satoru; Maejima, Makoto; and Homma, Masaru, to Nippon Telegraph and Telephone Public Corporation. System for monitoring operation of data processing system. 4,125,892, Cl. 364-200.000.

Fuller, Francis M., to Raymond International Inc. Method of stabilizing soil in pile bearing regions. 4,124,982, Cl. 405-232.000.

Fuller, William D.: *See—*
Goodman, Murray; Verlander, Michael S.; and Fuller, William D., 4,125,519, Cl. 528-363.000.

Fulton, Alan W.; Ooms, William J.; and Reed, Ray A., to Bell Telephone Laboratories, Incorporated. Integrated circuit transistor. 4,125,853, Cl. 357-36.000.

Funayama, Toshio: *See—*
Hori, Ryuzo; Masunaga, Kunihiko; Funayama, Toshio; Hoshi, Hirohiko; Ishiguro, Kazuhiko; and Umehara, Hidetomo, 4,125,091, Cl. 123-3.000.

Funk, Erwin D., to Kamyr Inc. Method and apparatus for continuously feeding solid particles into a pressurized container. 4,125,384, Cl. 48-86.00R.

Furuya, Takeo: *See—*
Akiyama, Yoshinori; Kurami, Kenshi; Takeshita, Junichiro; and Furuya, Takeo, 4,125,277, Cl. 280-745.000.

Futterer, Bodo, to Interelectric AG. Stator for an electrical machine. 4,125,791, Cl. 310-154.000.

G. D. Searle: *See—*
Dygos, John H., 4,125,544, Cl. 260-397.400.

G. D. Searle & Co.: *See—*
Mueller, Richard A., 4,125,532, Cl. 260-244.400.
Yen, Chung H., 4,125,531, Cl. 546-133.000.

G. D. Societa per Azioni: *See—*
Seragnoli, Enzo, 4,125,184, Cl. 198-442.000.

Gabrys, Kenneth F., to Chicago Rawhide Manufacturing Company. Apparatus for manufacturing fluid seals. 4,125,247, Cl. 249-66.00R.

Gabuev, Georgy K.: *See—*
Medovar, Boris I.; Latash, Yury V.; Bogachenko, Alexsey G.; Kaganovsky, Gary P.; Leibenzon, Semen A.; Eltsov, Konstantin S.; Gabuev, Georgy K.; and Poticha, Zinoviy I., 4,125,145, Cl. 164-252.000.

Galchina, Natalya I.: *See—*
Ryabenko, Evgeny A.; Bljum, Grigory Z.; Naida, Tatyana B.; Golub, Alexandr E.; Galchina, Natalya I.; Aronov, Alexandr R.; Semenova, Natalya F.; Raginskaya, Ljudmila K.; and Vonsovsky, Alexandr M., 4,125,596, Cl. 423-522.000.

Galileo Electro-Optics Corp.: *See—*
Tosswill, Christopher H.; and Beuscher, Clinton J., 4,125,776, Cl. 250-508.000.

Garapon, Jacques H.: *See—*
Cheradame, Herve M.; Garapon, Jacques H.; Guizard, Christian G.; and Brigodiot, Maryvonne, 4,125,692, Cl. 526-48.300.

Garbalizer Corporation of America: *See—*
Brewer, John C., 4,125,228, Cl. 241-243.000.

Garcia, Hector L.; and Hajdas, Edward F., to Garcia, Hector L. Fuel injection system. 4,125,101, Cl. 123-139.0AW.

Gardella, John M.: *See—*
Ciavattoni, Anthony; Ujvary, Josef; and Gardella, John M., 4,125,774, Cl. 250-439.00P.

Gardisette Holding AG: *See—*
Pape, Hermann; Schroeder, Peter; and Schmitz, Rudolf, 4,125,143, Cl. 160-348.000.

Garrett Corporation, The: *See—*
Harter, James B., 4,125,127, Cl. 137-494.000.

Garwin, Leo, to Kerr-McGee Refining Corporation. Hydrocarbon solvent treatment of bituminous materials. 4,125,459, Cl. 208-309.000.

Gastrock, William H.; and Asato, Goro, to American Cyanamid Company. 1,3-Dithiolane compounds and method of preparation thereof. 4,125,539, Cl. 260-332.20A.

Gates Rubber Company, The: *See—*
Posiviata, Richard W.; and Johnston, Jonathan A., 4,125,493, Cl. 260-17.4CL.
Sjogren, Axel O., 4,125,681, Cl. 429-99.000.

Gaughf, Orvis O., Jr. Improved notching shear for notching woven textile fabric or other flexible or pliable sheet material. 4,124,937, Cl. 30-229.000.

Geiger, Suzanne W.: *See—*
Pesson, Marcel E.; and Geiger, Suzanne W., 4,125,720, Cl. 544-318.000.

Gellert, Jobst U. Thermal valve pin. 4,125,352, Cl. 425-566.000.

General Dynamics Corporation: *See—*
Dugan, William P., 4,125,441, Cl. 204-12.000.
Lasker, George, 4,125,053, Cl. 89-36.00A.

General Electric Company: *See—*
MacLennan, Donald J., 4,125,785, Cl. 307-221.00D.
MacLennan, Donald J., 4,125,786, Cl. 307-221.00D.
Petersen, Louis P., 4,125,551, Cl. 260-448.20E.
Scott, Steven W.; and Wambach, Allen D., 4,125,571, Cl. 260-860.000.
Scott, Steven W., 4,125,572, Cl. 260-860.000.
Vostovich, Joseph E., 4,125,509, Cl. 260-33.6AQ.
Wahl, Ralph E.; and Bruhin, Alfred C., 4,125,741, Cl. 174-120.0SC.

General Filters, Inc.: *See—*
Kozinski, Richard C., 4,125,576, Cl. 261-106.000.

General Wadsworth Brick Corp.: *See—*
Martin, William R., 4,125,047, Cl. 83-581.100.

Genest, Leonard J.; and Messner, Daryle, to Monitron Industries, Inc. Electrically operated lock. 4,125,008, Cl. 70-279.000.

Geophysical Research Corporation: *See—*
Clark, Kenneth K., 4,125,027, Cl. 73-724.000.

Georgiades, Gregory: *See—*
Carrigan, Robert J.; and Georgiades, Gregory, 4,125,044, Cl. 83-356.300.

Gerkin, Richard M.: *See—*
Critchfield, Frank E.; Gerkin, Richard M.; and Hawker, Leslie E., 4,125,505, Cl. 260-33.20R.

Gertsch AG: *See—*
Kubelka, Axel R.; and Svoboda, Josef, 4,125,274, Cl. 280-618.000.

Gesellschaft fur Kernenergieverwertung in Schiffbau und Schiffahrt mbH: *See—*
Marten, Rainer; and Schneider, Harald, 4,125,769, Cl. 250-272.000.

Giardino, Pietro: *See—*
Arcamone, Federico; Bernardi, Luigi; Giardino, Pietro; and di Marco, Aurelio, 4,125,607, Cl. 424-180.000.

Giesemann, Herbert. Shaped articles of foam plastics. 4,125,664, Cl. 428-310.000.

Gillette Company, The: *See—*
Langlois, James L., 4,125,582, Cl. 264-73.000.

Gilliland, William O. Lubricatable floor glide for heavy appliances. 4,124,917, Cl. 16-42.00R.

Gindler, E. Melvin, to Pierce Chemical Company. Determination of triglycerides. 4,125,377, Cl. 23-230.00B.

Ginter, Sally P.: *See—*
Reder-James, Brenda J.; and Ginter, Sally P., 4,125,369, Cl. 8-115.600.

GKN Transmissions Limited: *See—*
Palmer, Bertram J.; and Steuer, Herbert K., 4,125,037, Cl. 74-732.000.

Glaeser, Hans H., to Du Pont de Nemours, E. I., and Company. Removal of $AlCl_3$ from crude $TiCl_4$ by addition of H_2O and NaCl. 4,125,586, Cl. 423-84.000.

Glinsmann, Gibert R., to Phillips Petroleum Company. Aqueous surfactant systems for in situ multiphase microemulsion formation. 4,125,156, Cl. 166-252.000.

Glivicky, Alexandr P.: *See—*
Bushnell, James D.; Glivicky, Alexandr P.; Leighton, Milton D.; and Sankey, Bruce M., 4,125,458, Cl. 208-309.000.

Globe-Union Inc.: *See—*
Beckford, Murray D.; Hennen, Roy E.; and Wells, Van D., 4,125,683, Cl. 429-121.000.

Gloxhuber, Christian: *See—*
Blum, Helmut; Gloxhuber, Christian; Heine, Christian; and Worms, Karl-Heinz, 4,125,608, Cl. 424-180.000.

Gluck, Herbert: *See—*
Roth, Michael; and Gluck, Herbert, 4,125,673, Cl. 428-447.000.

Goavec, Ernest. Method for the production of filter structure for cigarette filters. 4,125,061, Cl. 93-1.00C.

Godard, Pierre, to Saft-Societe des Accumulateurs Fixes et de Traction. Method and apparatus for charging storage batteries. 4,125,802, Cl. 320-35.000.

Goetzewerke Friedrich Goetze AG: *See—*
Leutgab, Hermann, 4,125,043, Cl. 82-45.000.
Schonherr, Wolf-Dieter; Wolfert, Karl-Heinz; and Lachmann, Veit, 4,125,266, Cl. 277-153.000.

Goldenberg, Marvin M.: *See—*
Schwan, Thomas J.; and Goldenberg, Marvin M., 4,125,529, Cl. 546-90.000.

Goldfarb, Leonic L.: *See—*
Turovsky, Izrail S.; Goldfarb, Leonic L.; Zamoschin, Leonid V.; and Zhukov, Alexandr I., 4,125,465, Cl. 210-46.000.

Goldhaft, Tevis M.; Kaitz, Charles; and Maier, George D., to Vineland Laboratories, Inc. Disinfectant composition. 4,125,628, Cl. 424-329.000.

Goldsworthy Engineering, Inc.: *See—*
Goldsworthy, William B., 4,125,423, Cl. 156-428.000.

Goldsworthy, William B., to Goldsworthy Engineering, Inc. Reinforced plastic tapered rod products and the method and apparatus for producing same. 4,125,423, Cl. 156-428.000.

Golub, Alexandr E.: *See—*
Ryabenko, Evgeny A.; Bljum, Grigory Z.; Naida, Tatyana B.; Golub, Alexandr E.; Galchina, Natalya I.; Aronov, Alexandr R.; Semenova, Natalya F.; Raginskaya, Ljudmila K.; and Vonsovsky, Alexandr M., 4,125,596, Cl. 423-522.000.

Gonzalez, Jose B. Decorative article and method. 4,125,657, Cl. 428-90.000.

Goodall, William M., to Bell Telephone Laboratories, Incorporated. Communication system. 4,125,744, Cl. 179-1.50R.

Goodfellow, Andrew C.: *See—*
Juriss, Ivan B.; Hay, Roger D.; Goodfellow, Andrew C.; Townson, Thomas; and Hay, Keith E., 4,124,964, Cl. 52-745.000.

Goodman, Murray; Verlander, Michael S.; and Fuller, William D. Polypeptides containing 3,4-dihydroxyphenylalanine. 4,125,519, Cl. 528-363.000.

Goodwin, E. L., to Addressograph Multigraph Corporation. Coliator unloader. 4,125,283, Cl. 294-87.00R.

Goodyear Aerospace Corporation: *See—*
McCready, John E., 4,125,526, Cl. 264-90.000.

Goodyear Tire & Rubber Company, The: *See—*
Kuczkowski, Joseph A., 4,125,515, Cl. 260-45.8NW.
White, John R.; Murray, Frank J.; and Becht, Cletus A., 4,125,660, Cl. 428-218.00A.
White, John R., 4,125,691, Cl. 521-51.000.

Goranson, Paul L.: *See—*
Harvey, Samuel E.; Whitehead, James S.; and Goranson, Paul L., 4,125,197, Cl. 214-310.000.
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Gray, Robin T.; and De Jong, Aaldert J., to Shell Oil Company. Tertiary alcohols. 4,125,484, Cl. 252-522.000.
Greene, Clarence K. Multiple fluid expansion energy extraction method and apparatus. 4,125,780, Cl. 290-4.00A.
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Grossman, Stephen R., to Scott Paper Company. Air decompaction of paper webs. 4,125,430, Cl. 162-207.000.
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Wangermann, Jochen, 4,125,253, Cl. 270-58.000.
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Arumugham, Rangaswamy, 4,125,863, Cl. 358-195.000.
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Gutmann, Manfred, to National Semiconductor Corporation. Interconnect logic. 4,125,869, Cl. 364-900.000.
Haas, Elwood L. High pressure cleaning device. 4,125,119, Cl. 134-100.000.
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Hackett, David E., to Caterpillar Tractor Co. Slant axis rotary mechanism. 4,125,030, Cl. 74-60.000.
Haddad, Philip O.; and Colura, Kenneth R., to Dow Chemical Company, The. Liquid-solids separator. 4,125,467, Cl. 210-83.000.
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Hagins, James H. Waste pipe support. 4,125,237, Cl. 248-49.000.
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Halbrook, Thurman P., to Tennis Machines, Inc. String clamping device and support structure therefor for racket and like stringing machines. 4,125,259, Cl. 273-73.00A.
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Hall, Ernest M., Jr., to Western Geophysical Co. of America. Seismic transducer for marshy terrains. 4,125,823, Cl. 340-17.00R.
Hallman, Philip J.; and Lawrence, Harold W., to National Research Development Corporation. Piling rigs. 4,124,987, Cl. 405-276.000.
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Hansen, Dan S., to F. L. Smidth & Co. Rotary kiln plant. 4,125,363, Cl. 432-106.000.
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Taylor, David L., 4,125,880, Cl. 365-242.000.
Harris, John D.; Fogden, Michael F.; and Mead, Graham E., to National Research Development Corporation. Wheelchairs. 4,125,169, Cl. 180-6.500.
Harrison, John R., to Westinghouse Air Brake Company. Fail-safe or gate. 4,125,784, Cl. 307-218.000.
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Harter, James B., to Garrett Corporation, The. Piston type fluid pressure valve. 4,125,127, Cl. 137-494.000.
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Helm, Dennis R., to Caterpillar Tractor Co. Engine and transmission control system. 4,125,039, Cl. 74-874.000.
Helmus, Sydney S., to Baker International Corporation. Annulus pressure controlled test valve with locking annulus pressure operated pressure trapping means. 4,125,165, Cl. 166-323.000.
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Henderson, Cyril, to American Safety Equipment Corporation. Emergency locking retractor with comfort belt tension. 4,125,231, Cl. 242-107.000.
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Henry, David W.; and Tong, George L., to SRI International. Phenyl-substituted rubidazone analogs. 4,125,704, Cl. 536-4.000.
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Hergert, Richard E.; and Sanford, Charles L., to Beloit Corporation. Headbox turbulence generator and damping sheet. 4,125,429, Cl. 162-123.000.
Herkes, Daniel J.; and Wagner, David P., to Illinois Tool Works Inc. Tamperproof fastener. 4,125,051, Cl. 85-45.000.
Hesse, Gunther; Strassnitzki, Manfred; and von Dolsperg, Helmut, to Wegmann & Co. Control switch for ammunition selection for weapons. 4,125,055, Cl. 89-33.0SF.
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Hicks, John E.; and Stolley, Ronald M., to Outboard Marine Corporation. Vehicle with convertible step and foot rest. 4,125,284, Cl. 296-62.000.
Hidaka, Hiroyoshi; Matsumoto, Ikuo; Ito, Yoshiaki; and Aoki, Nobuo, to Banyu Pharmaceutical Co., Ltd.; Hidaka, Hiroyoshi; and Aoki, Nobuo. Preparation of -aminoalkanoic acid arylamides. 4,125,730, Cl. 560-37.000.
Hierholzer, Frank J., Jr.; Ancona, John A.; and Shelton, Gerald L., to Emerson Electric Co. Silicon carbide shapes and method of producing them. 4,125,756, Cl. 219-121.0LM.
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Hilterhaus, Karl-Heinz, to Chemie-Anlagenbau Bischofsheim GmbH; and Metallgesellschaft AG. Process for the production of polyurethanes dissolved in a solvent and also their use for the production of fabricated shapes, especially of microporous structures. 4,125,693, Cl. 521-63.000.
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Nagase, Hiroshi; Okuyama, Toshiaki; Kubota, Yuzuru; and Suzuki, Katsunori, 4,125,796, Cl. 318-175.000.
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Holtje, Wilfried, to Rollei Werke Franke & Heidecke. Automatic electronic flash device. 4,125,766, Cl. 250-214.0SF.
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Sakurai, Yoshitoshi, 4,124,977, Cl. 60-282.000.
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Saunders, Graham J., 4,124,984, Cl. 405-293.000.
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Lahr, Robert G., 4,125,261, Cl. 273-86.00B.
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Liptak, Richard M., 4,125,243, Cl. 248-473.000.
Interelectric AG: *See*—
Futterer, Bodo, 4,125,791, Cl. 310-154.000.
Interlego A.G.: *See*—
Bach, Erik; and Ryaa, Jan, 4,124,949, Cl. 46-23.000.
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Eige, John J.; Patel, Arvind M.; Roberts, Spencer D.; and Stedman, David, 4,125,881, Cl. 360-50.000.
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Wallsten, Hans I., 4,125,641, Cl. 427-296.000.

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Fujimoto, Kazumi; and Iribe, Toshio, 4,125,189, Cl. 206-387.000.

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Kawai, Masaru; and Minamidani, Azusa, 4,125,390, Cl. 65-34.000.

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Ebert, Claus, 4,125,304, Cl. 312-257.0SM.

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Black, Robert P., 4,125,079, Cl. 112-262.000.

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Yamamoto, Akira; Shiraishi, Masao; Isozumi, Masakatu; and Yoshikawa, Masato, 4,125,699, Cl. 526-169.200.

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Kobayashi, Yasushi; and Ito, Akira, 4,125,133, Cl. 139-435.000.

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Hidaka, Hiroyoshi; Matsumoto, Ikuo; Ito, Yoshiaki; and Aoki, Nobuo, 4,125,730, Cl. 560-37.000.

ITW Fastex Italia, S.p.A.: *See*—
Aimar, Michele, 4,125,312, Cl. 339-107.000.

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Kimura, Tohru; Iwao, Osamu; Kawai, Masahiko; and Tanimoto, Hiroshi, 4,125,674, Cl. 428-469.000.

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Schwartzman, Irwin J.; and Wilgermein, Paul K., 4,125,050, Cl. 85-41.000.

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Jackson, Charles D. Breakerless ignition distributor for internal combustion engines. 4,125,103, Cl. 123-146.50A.

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Jackson, Steven M., to Mobil Oil Corporation. Process for increasing hydrogenation rate of polymerized n-alphaolefins. 4,125,569, Cl. 260-683.900.

Jacobs, Philip C., Jr., to Gould Inc. Electric fuse with equalized filler duty. 4,125,819, Cl. 337-293.000.

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Bretschneider, Hermann; Hueber, Herman P.; Louzil, Friedrich; Fischer, Karl; Jager, Lothar; and Sagan, Johann, 4,125,844, Cl. 346-74.100.

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Jamieson, Hugh V., Jr. Universal clamping system. 4,125,251, Cl. 269-45.000.

Jankowski, Thomas M.: *See*—
Cashel, Aloysius T.; Perna, Frank; Trussell, Gerald C.; D'Souza, Alfred C.; Karlin, Richard A.; Caruth, James R.; Van Ermen, Gary L.; Arnston, Robert W.; Comiskey, Gary F.; Borgens, Frederick R.; Kreft, Keith A.; Damm, Arthur; Sienaski, Dennis C.; Shepardson, Robert C.; Leung, Yam C.; and Jankowski, Thomas M., 4,125,894, Cl. 364-442.000.

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Fleischmann, Martin; Jansson, Robert E. W.; and Marshall, Rodney J., 4,125,439, Cl. 204-1.00R.

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Yamamoto, Akira; Shiraishi, Masao; Isozumi, Masakatu; and Yoshikawa, Masato, 4,125,699, Cl. 526-169.200.

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Coopersmith, Myron; and Jasion, Leo Z., deceased, 4,125,549, Cl. 260-425.000.

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Jellissen, Roy H., to Motorola, Inc. Hall effect ignition system housing and method. 4,124,936, Cl. 29-602.00R.

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Kristen, Klaus; and Scheidler, Herwig, 4,125,357, Cl. 431-78.000.

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Compton, Ralph M.; and Jenkins, Johnny W., Jr., 4,125,132, Cl. 139-255.000.

Jenkins, William A., to Monarch Marking Systems, Inc. Tag attaching apparatus. 4,125,215, Cl. 227-67.000.

Jennie, Fred L., to Weatherby, Inc. Mechanism for gas control in an automatic firearm. 4,125,054, Cl. 89-193.000.

Jeremic, Miroslav, to Kerason SA. Sheet punching machine. 4,125,045, Cl. 83-389.000.

Jeumont-Schneider: *See*—
Jouanny, Robert, 4,125,252, Cl. 269-47.000.

Joh, Yasushi; and Yamazaki, Masahiro, to Nippon Zeon Co., Ltd. Hollow-fiber permeability apparatus. 4,125,468, Cl. 210-321.00B.

Johns Hopkins University, The: *See*—
Fischell, Robert E., 4,125,116, Cl. 128-404.000.

Johnsen, Albert. Clay extrusion apparatus. 4,125,349, Cl. 425-192.00R.

Johnson, Bruce N.; and Cartsunis, Louis P., to Kerr-McGee Chemical Corporation. Composition and method for defoliation. 4,125,396, Cl. 71-70.000.

Johnson, Francis;: *See*—
White, William L.; and Johnson, Francis;, 4,125,556, Cl. 260-464.000.

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Bemmels, Cyrus W.; Mumber, Richard A.; and Schirripa, Thomas J., 4,125,665, Cl. 428-352.000.
Repke, Virginia L., 4,125,114, Cl. 128-280.000.

Johnston, Jonathan A.: *See*—
Posiviata, Richard W.; and Johnston, Jonathan A., 4,125,493, Cl. 260-17.4CL.

Jones, Donald H., to Contraves Gorez Corporation. Power controller with a modular power output. 4,125,800, Cl. 318-681.000.

Jones, Giffin D.: *See*—
Sullivan, Edward J.; and Jones, Giffin D., 4,125,478, Cl. 252-316.000.

Jones, Graham S., to Coal Industry (Patents) Limited. Apparatus for mixing two flowable substances. 4,125,334, Cl. 366-181.000.

Jones, Lewis O., to Xerox Corporation. High surface area ferromagnetic carrier materials. 4,125,667, Cl. 428-403.000.

Jones, Richard F.: *See*—
Badmin, John S.; and Jones, Richard F., 4,125,613, Cl. 424-250.000.

Josten, Friedrich; Cherubim, Martin; and Renkes, Karl-Heinz, to Deutsche Texaco Aktiengesellschaft. Method for manufacturing heat-cured molded articles from cement. 4,125,497, Cl. 260-18.00R.

Jouanny, Robert, to Jeumont-Schneider. Power semiconductor assembly and the method and apparatus for assembly thereof. 4,125,252, Cl. 269-47.000.

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Downing, Roger S.; van Amstel, Jan; and Joustra, Annie H., 4,125,483, Cl. 252-455.00R.

Jukes, John A.; Pound, Thomas C.; and Cascarano, Wayne A., to Northern Telecom Limited. Latex modified pulp insulated conductors. 4,125,645, Cl. 427-117.000.

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Juriss, Ivan B.; Hay, Roger D.; Goodfellow, Andrew C.; Townson, Thomas; and Hay, Keith E. Buildings. 4,124,964, Cl. 52-745.000.

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Kawai, Shoji; Yamada, Shigeki; and Kishimoto, Shinichi, 4,125,372, Cl. 23-230.00B.

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Sato, Yo, 4,125,074, Cl. 101-288.000.

Kadison, Leon A.: *See*—
Donovan, Lawrence P.; Maguire, Eileen; and Kadison, Leon A., 4,125,649, Cl. 427-307.000.

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Medovar, Boris I.; Latash, Yury V.; Bogachenko, Alexsey G.; Kaganovsky, Gary P.; Leibenzon, Semen A.; Eltsov, Konstantin S.; Gabuev, Georgy K.; and Poticha, Zinoviy I., 4,125,145, Cl. 164-252.000.

Kah, Carl L. C. Sequencing valve. 4,125,124, Cl. 137-119.000.

Kaiser, Hans, to Hanseatischer Maschinenbau GmbH. Apparatus for consolidating textile fibrous webs by rubbing in a condenser. 4,124,921, Cl. 19-153.000.

Kaitz, Charles: *See*—
Goldhaft, Tevis M.; Kaitz, Charles; and Maier, George D., 4,125,628, Cl. 424-329.000.

Kajima Corporation: *See*—
Sato, Kuniaki, 4,125,217, Cl. 228-169.000.
Kakuchi, Masami; Sugawara, Shungo; Murase, Kei; and Matsuyama, Kentaro, to Nippon Telegraph and Telephone Public Corporation. Polymeric resist mask composition. 4,125,672, Cl. 428-421.000.
Kakui, Kuniaki, to Toyo Kogyo Co., Ltd. Rotary piston engine having reinforced side housings. 4,125,347, Cl. 418-83.000.
Kaldenbach, Erwin: *See*—
Linnerz, Wilhelm; Stodt, Eberhardt; and Kaldenbach, Erwin, 4,125,068, Cl. 100-19.00R.
Kalnin, Laurence N.: *See*—
Mayo, John D.; and Kalnin, Laurence N., 4,125,115, Cl. 128-327.000.
Kaloi, Cyril M., to United States of America, Navy. Dual notch fed electric microstrip dipole antennas. 4,125,837, Cl. 343-700.0MS.
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Kamath, Vasanth R., to Pennwalt Corporation. Polymerization process with reduced cycle time employing polyfunctional free radical initiators. 4,125,695, Cl. 526-73.000.
Kamath, Vasanth R., to Pennwalt Corporation. Polymerization process using di-t-butyl diperoxycarbonate as a finishing catalyst. 4,125,696, Cl. 526-73.000.
Kamei, Mitsuru; Osamu, Uno; Toru, Ogawa; Yoichiro, Ishii; and Masahiro, Satomi, to Doryokuro Kakunenryo Kaihatsu Jigyodan; and Nisco Kabushiki Kaisha. Apparatus for detecting conductive liquid level. 4,125,021, Cl. 73-304.00R.
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Byrd, James I.; and Kaminski, Elton G., 4,125,009, Cl. 72-350.000.
Kamio, Takayoshi; and Miyamoto, Akio, to Fuji Photo Film Co., Ltd. Desensitizing composition and desensitizing method. 4,125,636, Cl. 427-150.000.
Kamo, Keizo: *See*—
Torii, Kyozo; Koshino, Kenji; Niimi, Yuji; Ogawa, Mashahiro; and Kamo, Keizo, 4,125,026, Cl. 74-713.000.
Kamyr Inc.: *See*—
Funk, Erwin D., 4,125,384, Cl. 48-86.00R.
Kaneko, Akira; Ohya, Masaki; Suzuki, Masayasu; and Kobayashi, Akio, to Kureha Kagaku Kogyo Kabushiki Kaisha. Information signal recording disc. 4,125,654, Cl. 428-64.000.
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Kanne, John; and Deverell, Harry E., to True Temper Corporation. Tubular golf shaft of stainless steel. 4,125,260, Cl. 273-80.00R.
Kanzelberger, James C., to Contemporary, Inc. Decorative plaques and process. 4,125,655, Cl. 428-67.000.
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Cashel, Aloysius T.; Perna, Frank; Trussell, Gerald C.; D'Souza, Alfred C.; Karlin, Richard A.; Caruth, James R.; Van Ermen, Gary L.; Arnston, Robert W.; Comiskey, Gary F.; Borgens, Frederick R.; Kreft, Keith A.; Damm, Arthur; Sienaski, Dennis C.; Shepardson, Robert C.; Leung, Yam C.; and Jankowski, Thomas M., 4,125,894, Cl. 364-442.000.
Karlowicz, Janusz R. Punch press controller. 4,125,182, Cl. 192-125.00A.
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Kastner, Paul; and Heinze, Christoph, to Hoechst Aktiengesellschaft. Process and apparatus for the continuous production of vinyl chloride polymers in aqueous emulsion. 4,125,574, Cl. 260-884.000.
Katoh, Hiroshi; Onoe, Yasumitsu; Kawamura, Koichi; and Akisue, Osamu, to Nippon Steel Corporation. Method for producing steel strip or steel sheet containing carbide and nitride forming elements. 4,125,416, Cl. 148-12.00F.
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Sugie, Akihiko; Shimomura, Hiromi; Katsube, Junki; and Yamamoto, Hisao, 4,125,731, Cl. 560-53.000.
Katsura, Hidetoshi: *See*—
Tsuchihashi, Michihiro; Saito, Masato; Yamanoshita, Makoto; Katsura, Hidetoshi; Myodo, Osamu; and Maeyama, Koichiro, 4,125,888, Cl. 362-231.000.
Katsuyama, Harumi: *See*—
Ikenoue, Shinpei; Katsuyama, Harumi; and Masuda, Takao, 4,125,403, Cl. 96-114.100.
Kaukeinen, Joseph Y.; and Michener, John R., to Eastman Kodak Company. Electrophotosensitive migration imaging apparatus and method. 4,125,322, Cl. 355-4.000.
Kaukeinen, Joseph Y.: *See*—
Frank, Lee F.; and Kaukeinen, Joseph Y., 4,125,319, Cl. 350-362.000.
Kawai, Kazuo; Tamori, Michitoshi; Yanagidaira, Hidetaka; and Shintani, Sotokichi, to Kokusai Denshin Denwa Co., Ltd. Bessel function type automatic delay equalizer. 4,125,899, Cl. 364-724.000.
Kawai, Masahiko: *See*—
Kimura, Tohru; Iwao, Osamu; Kawai, Masahiko; and Tanimoto, Hiroshi, 4,125,674, Cl. 428-469.000.
Kawai, Masaru; and Minamidani, Azusa, to Ise Electronics Corporation. Method of vacuum-sealing vacuum articles. 4,125,390, Cl. 65-34.000.
Kawai, Shoji; Yamada, Shigeki; and Kishimoto, Shinichi, to Kabushiki Kaisha Kyoto Kaiichi Kagaku. Method and device for testing liquids. 4,125,372, Cl. 23-230.00B.
Kawamoto, Junichi; Ito, Yasuo; Ito, Akio; Nakamua, Tamotsu; Nakamura, Motoyuki; Yamaoto, Yoshiaki; and Yonekura, Koji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Refractory material for labeling, which contains an activatable element. 4,125,144, Cl. 164-4.000.
Kawamura, Hideo: *See*—
Miyanohara, Isao; Miyazaki, Hiroshi; and Kawamura, Hideo, 4,125,466, Cl. 210-67.000.
Kawamura, Koichi: *See*—
Katoh, Hiroshi; Onoe, Yasumitsu; Kawamura, Koichi; and Akisue, Osamu, 4,125,416, Cl. 148-12.00F.
Kawanami, Mitsuru: *See*—
Ohhinata, Ichiro; Okuhara, Shinzi; Kawanami, Mitsuru; and Tokunaga, Michio, 4,125,787, Cl. 307-252.00A.
Kawasaki Steel Corporation: *See*—
Goto, Minari; and Komura, Hideo, 4,125,647, Cl. 427-300.000.
Kayashima, Kozo, to Hitachi, Ltd. Multiple format print pattern generating apparatus. 4,125,829, Cl. 340-324.0AD.
Kazuhiko Nakajima: *See*—
Teramura, Masao, 4,125,248, Cl. 251-308.000.
Keil, Joseph W.: *See*—
Fenton, William N.; and Keil, Joseph W., 4,125,470, Cl. 252-27.000.
Kelly, Calvin E.; and Nicely, Thomas E., to United States Steel Corporation. Guiding means for coke oven doors. 4,125,438, Cl. 202-248.000.
Kelly, Ward L. Elastic powered catapult. 4,125,106, Cl. 124-17.000.
Kennametal Inc.: *See*—
Huber, Joseph B.; and Marcinko, Andrew M., 4,125,007, Cl. 72-273.000.
Kennecott Copper Corporation: *See*—
Huff, Ray V.; and Davidson, Donald H., 4,125,289, Cl. 299-4.000.
Kennedy, James A.: *See*—
Downey, David L.; Kennedy, James A.; and Neely, Liston E., 4,125,746, Cl. 179-15.0BA.
Kennedy, Thomas E.; Butts, Earl E.; and Steelman, Melvin W., to Tyler Refrigeration Corporation. Refrigeration system incorporating a single air circulation means for a combination refrigerated display case and walk-in cooler. 4,124,996, Cl. 62-256.000.
Kerason SA: *See*—
Jeremic, Miroslav, 4,125,045, Cl. 83-389.000.
Kerr-McGee Chemical Corporation: *See*—
Johnson, Bruce N.; and Cartsunis, Louis P., 4,125,396, Cl. 71-70.000.
Rado, Theodore A.; and Morris, Alan J., 4,125,385, Cl. 55-269.000.
Schmoyer, Laurence F., 4,125,590, Cl. 423-292.000.
Kerr-McGee Refining Corporation: *See*—
Garwin, Leo, 4,125,459, Cl. 208-309.000.
Kessler, Kurt: *See*—
Franke, Johannes; Kessler, Kurt; Kuhne, Ulrich; Sauerbier, Heinz; Schneider, Kurt; and Unbehaun, Karl, 4,125,154, Cl. 165-169.000.
Kestner, Mark O.; and Krueger, Robert H., to Borg-Warner Corporation. Scale resistant heat transfer surfaces and a method for their preparation. 4,125,152, Cl. 165-133.000.
Ketley, Arthur D.; and Morgan, Charles R., to W. R. Grace & Co. Radiation cured coatings for fiber optics. 4,125,644, Cl. 427-36.000.
Kidwell, Roger L.; and Lynch, Gary J., to Monsanto Company. Terminal olefin preparation. 4,125,567, Cl. 260-677.00R.
Kicl, Louise A. Recliner-rocker geriatric wheel chair. 4,125,269, Cl. 280-30.000.
Kikumoto, Ryoji: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,125,604, Cl. 424-177.000.
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,125,619, Cl. 424-267.000.
Kimberly-Clark Corporation: *See*—
Morman, Raymond A.; and Duchane, David V., 4,125,113, Cl. 128-260.000.
Kimura, Tohru; Iwao, Osamu; Kawai, Masahiko; and Tanimoto, Hiroshi, to Toyo Aluminium Kabushiki Kaisha. Aluminum foil for an electrode of an electrolytic capacitor. 4,125,674, Cl. 428-469.000.
King, Frederick D., to Northern Telecom Limited. Method for manufacturing an optical fibre with plasma activated deposition in a tube. 4,125,389, Cl. 65-3.00A.
Kinoshita, Toshiharu; Shinoda, Yoshio; Oyamada, Takashi; Masuda, Mitsuo; and Arai, Noritomo, to Tamura Electric Works, Ltd. Key telephone systems. 4,125,749, Cl. 179-99.000.
Kinsman, Gordon F., to Polaroid Corporation. Laminar cells and methods for making the same. 4,125,686, Cl. 429-152.000.
Kinsman, Gordon F.: *See*—
Bloom, Stanley M.; Chiklis, Charles K.; and Kinsman, Gordon F., 4,125,685, Cl. 429-122.000.
Kirschner, Barry A., to RCA Corporation. Phase lock loop indicator. 4,125,815, Cl. 331-8.000.
Kishimoto, Shinichi: *See*—
Kawai, Shoji; Yamada, Shigeki; and Kishimoto, Shinichi, 4,125,372, Cl. 23-230.00B.
Kishino, Fumio: *See*—
Ishii, Akira; Kishino, Fumio; and Yamagishi, Kingo, 4,125,860, Cl. 358-128.000.
Kita, Takehiko: *See*—
Otsubo, Kizuku; Murasaki, Akira; and Kita, Takehiko, 4,125,096, Cl. 123-117.00A.
Kitamoto, Tatsuji: *See*—
Dezawa, Shin-Ichiro; Sasazawa, Koji; Kitamoto, Tatsuji; and Yamazaki, Nobuo, 4,125,474, Cl. 252-62.620.

Kito, Terukazu: *See—*
Murata, Kazuo; and Kito, Terukazu, 4,125,897, Cl. 364-702.000.
Kitou, Nobuo: *See—*
Matsui, Toshio; and Kitou, Nobuo, 4,125,362, Cl. 432-60.000.
Kiyohara, Michiya; Okada, Toshiyuki; and Yamamoto, Hideyuki, to Osaka Transformer Co., Ltd. Method and apparatus for shortcircuiting arc welding. 4,125,759, Cl. 219-137.0PS.
Kiyota, Yuhiko, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Multicylinder engine. 4,125,098, Cl. 123-119.0LR.
Kizu, Fumio; Hanano, Kazuyoshi; Sotoyama, Kaoru; and Matsuo, Masayoshi, to Toyo Kogyo Co., Ltd. Apex seals for rotary piston engines. 4,125,399, Cl. 75-125.000.
Klaudinyi, Bela: *See—*
Friedrichs, James R.; Snajdr, Edward A.; and Klaudinyi, Bela, 4,125,409, Cl. 106-66.000.
Klaus, Kaspar; and Zepp, Fritz. Trafficable surface for mechanical parking apparatus, ramps, lifting platforms or the like. 4,125,340, Cl. 404-35.000.
Klay, Frank: *See—*
Ernst, Frederick T.; and Klay, Frank, 4,125,207, Cl. 222-130.000.
Klein, Gerald B. Gated can end with shear offset defining gate. 4,125,204, Cl. 220-268.000.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Tholen, Paul; and Finsterwalder, Gerhard, 4,124,979, Cl. 60-599.000.
Klowak, Bernard G.; Pauls, Walter L.; and Vermillon, Frederick J., Jr., to American Can Company. Patterned creping of fibrous products. 4,125,659, Cl. 428-153.000.
Klyce, Thomas A., to Ranger Tool Company, Inc. Casing transport apparatus. 4,124,919, Cl. 17-1.00F.
Knox, Walter R.: *See—*
Hill, James C.; and Knox, Walter R., 4,125,488, Cl. 521-128.000.
Hill, James C.; and Knox, Walter R., 4,125,511, Cl. 260-40.00R.
Hill, James C.; and Knox, Walter R., 4,125,520, Cl. 260-830.0TW.
Hill, James C.; and Knox, Walter R., 4,125,524, Cl. 528-366.000.
Kobayashi, Akio: *See—*
Kaneko, Akira; Ohya, Masaki; Suzuki, Masayasu; and Kobayashi, Akio, 4,125,654, Cl. 428-64.000.
Kobayashi, Shigeo: *See—*
Watanabe, Jun; Ohta, Akira; and Kobayashi, Shigeo, 4,125,638, Cl. 429-199.000.
Kobayashi, Yasushi; and Ito, Akira, to Nissan Motor Company, Limited. Air jet loom with improved air guiding comb. 4,125,133, Cl. 139-435.000.
Kobe Steel, Ltd.: *See—*
Oishi, Minoru; Hirakoso, Keiichiro; Iio, Katsuro; Nagai, Yasuhiro; and Nariai, Tetsurou, 4,125,758, Cl. 219-126.000.
Kobos, Fred: *See—*
Taylor, Edwin K.; Williams, James H.; and Kobos, Fred, 4,124,971, Cl. 57-9.000.
Kochis, August J., to Eckel Industries, Inc. Automatic closure. 4,124,955, Cl. 49-237.000.
Koerber, Barbara M.: *See—*
Freenor, Francis J., III; and Koerber, Barbara M., 4,125,397, Cl. 71-103.000.
Koert, Hubbert: *See—*
Triebel, Wolfgang; Hari, Siegfried; Koert, Hubbert; and Evers, Fritz, 4,125,669, Cl. 428-412.000.
Kohl, Wilhelm; Eibner, Robert; Nolle, Hans-Heinrich; Schneider, Alfred; and Moldovany, Nikolaus-Johann, to U.S. Philips Corporation. ULV pesticide containing fertilizer. 4,125,393, Cl. 71-3.000.
Kohler, Michel: *See—*
Lecloux, Andre; Kohler, Michel; and Dantinne, Paul, 4,125,543, Cl. 260-348.250.
Kohman, Warren G., to United States of America, Navy. Voltage level shifting device. 4,125,788, Cl. 307-264.000.
Kohner, Inc.: *See—*
Becker, James R., 4,124,950, Cl. 46-109.000.
Kokubu, Tokio: *See—*
Arai, Yoshiyasu; Anahara, Meiji; Saka, Masanori; Kokubu, Tokio; and Takeuchi, Kunio, 4,124,972, Cl. 57-328.000.
Kokusai Denshin Denwa Co., Ltd.: *See—*
Kawai, Kazuo; Tamori, Michitoshi; Yanagidaira, Hidetaka; and Shintani, Sotokichi, 4,125,899, Cl. 364-724.000.
Kolaian, Jack H.; McCoy, Frederic C.; and Patterson, John A., to Texaco Inc. Detergents containing a fatty alcohol builder and a water-insoluble inorganic absorbent. 4,125,475, Cl. 252-89.00R.
Komarov, Jury I.; Parshin, Alexei N.; and Titov, Dmitry V. Weaving mechanism of a wave-type shedding loom. 4,125,134, Cl. 139-436.000.
Komatsu, Toshiaki: *See—*
Yamade, Hirotada; Nakagome, Takenari; and Komatsu, Toshiaki, 4,125,611, Cl. 424-246.000.
Komminoth, Paul; Robinson, Tibor; and Urosevic, Milica, to Sandoz Ltd. Treatment process for textile substrates comprising regenerated cellulose. 4,125,652, Cl. 427-390.00C.
Komura, Hideo: *See—*
Goto, Minari; and Komura, Hideo, 4,125,647, Cl. 427-300.000.
Konishiroku Photo Industry Co., Ltd.: *See—*
Fujita, Masami; and Gunshi, Hirokazu, 4,125,850, Cl. 354-204.000.
Koo, Tuh-Kai: *See—*
Chen, Peter C.; Stewart, John K., Jr.; and Koo, Tuh-Kai, 4,125,427, Cl. 156-657.000.
Koppe, Herbert: *See—*
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; and Hoefke, Wolfgang, 4,125,620, Cl. 424-273.00R.
Korner, Klaus: *See—*
Rassow, Bernd; Wolf, Diethard; and Korner, Klaus, 4,125,320, Cl. 351-13.000.
Koshino, Kenji: *See—*
Torii, Kyozo; Koshino, Kenji; Niimi, Yuji; Ogawa, Mashahiro; and Kamo, Keizo, 4,125,026, Cl. 74-713.000.
Koyo Seiko Company Limited: *See—*
Hirasawatsu, Tetsuo; and Matsueda, Takashi, 4,124,999, Cl. 64-17.00R.
Kozinski, Richard C., to General Filters, Inc. Water distributor trough primarily for a warm air furnace mounted humidifier. 4,125,576, Cl. 261-106.000.
Kraftwerk Union Aktiengesellschaft: *See—*
Bezold, Helmut, 4,125,577, Cl. 264-0.500.
Fromel, Gustav; Suchy, Peter; and Ulrych, Gerhard, 4,125,434, Cl. 176-76.000.
Kramer, Winfried: *See—*
Steinhof, Dieter; and Kramer, Winfried, 4,125,002, Cl. 66-75.200.
Kreft, Keith A.: *See—*
Cashel, Aloysius T.; Perna, Frank; Trussell, Gerald C.; D'Souza, Alfred C.; Karlin, Richard A.; Caruth, James R.; Van Ermen, Gary L.; Arnston, Robert W.; Comiskey, Gary F.; Borgens, Frederick R.; Kreft, Keith A.; Damm, Arthur; Sienaski, Dennis C.; Shepardson, Robert C.; Leung, Yam C.; and Jankowski, Thomas M., 4,125,894, Cl. 364-442.000.
Krehbiel, Vivian D. Photographic film processor. 4,125,851, Cl. 354-321.000.
Kresak, Fedor P.: *See—*
Beer, Frederick W.; Kresak, Fedor P.; and Kuev, Conio, 4,124,967, Cl. 53-446.000.
Kress, Dieter, to MAPAL Fabrik fur Prazisionswerkzeuge Dr. Kress KG. Clamping arrangement for the replaceable blade of a rotary cutting tool. 4,125,342, Cl. 408-179.000.
Krezak, John E.; and Matics, John R., to Boeing Company, The. Wheeled vehicle moving apparatus. 4,125,029, Cl. 74-13.000.
Kristen, Klaus; and Scheidler, Herwig, to Jenaer Glaswerk Schott & Gen. Control and monitoring system for gas burners. 4,125,357, Cl. 431-78.000.
Kritzler, Gerhard; Schluter, Siegfried H.; and Eckert, Paul, to Apparatebau Rothemuhle Brandt & Kritzler. Heat exchange elements. 4,125,149, Cl. 165-10.000.
Krob, Erwin; and Svoboda, Josef, to TMC Corporation. Safety ski binding. 4,125,275, Cl. 280-626.000.
Kroh, Norma J.; and Spector, George. Food slicer. 4,125,046, Cl. 83-437.000.
Kroplinski, Thaddeus F.; and Brauer, Melvin, to N L Industries, Inc. Stabilized diphenylmethane diisocyanate prepolymer. 4,125,545, Cl. 260-404.500.
Krueger, Robert H.: *See—*
Kestner, Mark O.; and Krueger, Robert H., 4,125,152, Cl. 165-133.000.
Kruse, Robert L., to Monsanto Company. Polymer polyblend composition. 4,125,573, Cl. 260-876.00R.
Kubelka, Axel R.; and Svoboda, Josef, to Gertsch AG. Safety ski binding and ski boot combination. 4,125,274, Cl. 280-618.000.
Kubis, Charles S.: *See—*
Moller, Jens Langhoff; and Kubis, Charles S., 4,125,080, Cl. 113-1.00R.
Kubo, Masayoshi: *See—*
Murakami, Yasukazu; Kubo, Masayoshi; and Watanabe, Shoji, 4,125,521, Cl. 528-274.000.
Kubota, Yuzuru: *See—*
Nagase, Hiroshi; Okuyama, Toshiaki; Kubota, Yuzuru; and Suzuki, Katsunori, 4,125,796, Cl. 318-175.000.
Kuczkowski, Joseph A., to Goodyear Tire & Rubber Company, The. Antioxidant combination of esters and amines. 4,125,515, Cl. 260-45.8NW.
Kuehler, Christopher W.: *See—*
Tamm, Paul W.; and Kuehler, Christopher W., 4,125,453, Cl. 208-11.00R.
Kuev, Conio: *See—*
Beer, Frederick W.; Kresak, Fedor P.; and Kuev, Conio, 4,124,967, Cl. 53-446.000.
Kugelfischer Georg Schafer & Co.: *See—*
Heurich, Gunther; and Hofmann, Heinrich, 4,125,298, Cl. 308-189.00R.
Kuhl, Adolf; and Heistand, Ernst. Graphic pattern or the like and method of producing the same. 4,124,947, Cl. 40-453.000.
Kuhlman Corporation: *See—*
Cochran, John P., 4,125,750, Cl. 200-144.00R.
Kuhne, Ulrich: *See—*
Franke, Johannes; Kessler, Kurt; Kuhne, Ulrich; Sauerbier, Heinz; Schneider, Kurt; and Unbehaun, Karl, 4,125,154, Cl. 165-169.000.
Kummer, Werner: *See—*
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; and Hoefke, Wolfgang, 4,125,620, Cl. 424-273.00R.
Kummins, Joel S.; and Smith, John C., Jr., to Dow Corning Corporation. Process for priming and compositions therefor. 4,125,507, Cl. 260-31.4EP.
Kunze, Dietmar; and Raschka, Walter. Process for the production of very pure bromine. 4,125,595, Cl. 423-500.000.
Kupsky, George A.; and Santchi, Douglas L., to Owens-Illinois, Inc. Edge terminations for gas discharge display panel device and method of manufacturing same. 4,124,926, Cl. 29-25.130.

Kurami, Kenshi: *See*—
Akiyama, Yoshinori; Kurami, Kenshi; Takeshita, Junichiro; and Furuya, Takeo, 4,125,277, Cl. 280-745.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Kaneko, Akira; Ohya, Masaki; Suzuki, Masayasu; and Kobayashi, Akio, 4,125,654, Cl. 428-64.000.
Kurosaki Refractories Co., Ltd.: *See*—
Ueno, Haruyuki, 4,125,407, Cl. 106-57.000.
Kurumada, Tomoyuki: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Osawa, Hisayou, 4,125,533, Cl. 546-19.000.
Kuzel, Josef J., to Borg-Warner Corporation. Multitube heat exchanger. 4,125,280, Cl. 285-137.00R.
L. Schuler GmbH: *See*—
Maier, Karl; and Hohn, Herbert, 4,125,072, Cl. 100-207.000.
Laboratoire Roger Bellon: *See*—
Pesson, Marcel E.; and Geiger, Suzanne W., 4,125,720, Cl. 544-318.000.
Lachmann, Veit: *See*—
Schonherr, Wolf-Dieter; Wolfert, Karl-Heinz; and Lachmann, Veit, 4,125,266, Cl. 277-153.000.
Lahr, Robert G., to Ideal Toy Corporation. Toy vehicle and toy vehicle game. 4,125,261, Cl. 273-86.00B.
Lam, Tim Y.: *See*—
Drabing, Richard B.; Lam, Tim Y.; and Hoard, Charles Q., 4,125,763, Cl. 235-302.000.
Lancelot, Harry B., III; and MacRobbie, Robert M., to Brown Company. Joist hanger. 4,124,962, Cl. 52-702.000.
Land, Edwin H., to Polaroid Corporation. Electrical cells and batteries. 4,125,684, Cl. 429-122.000.
Landers, Don B., to Oil States Rubber Co. Seal assembly for hollow tubular structure. 4,124,988, Cl. 405-228.000.
Landoll Corporation: *See*—
Landoll, Donald R., 4,125,198, Cl. 214-506.000.
Landoll, Donald R., to Landoll Corporation. Trailer having shiftable undercarriage. 4,125,198, Cl. 214-506.000.
Landwerlen, Joseph E. Transom saver. 4,125,236, Cl. 248-4.000.
Lane, Floyd J.: *See*—
McGee, John K.; and Lane, Floyd J., 4,125,060, Cl. 92-59.000.
Lang, Andrew R. Diamond identification. 4,125,770, Cl. 250-272.000.
Lang, Hans-Jochen; and Muschaweck, Roman, to Hoechst Aktiengesellschaft. Thiazolidine derivatives. 4,125,614, Cl. 424-251.000.
Lang, Robert D. Roller assembly. 4,125,183, Cl. 193-37.000.
Langdon, William K.: *See*—
O'Brien, Edward F.; and Langdon, William K., 4,125,382, Cl. 44-51.000.
Langlois, James L., to Gillette Company, The. Marbleization of plastic materials. 4,125,582, Cl. 264-73.000.
Lanier Business Products, Inc.: *See*—
Mohammadioun, Said, 4,125,865, Cl. 360-32.000.
Lannert, Kent P., to Monsanto Company. Detergent formulation containing novel ether carboxylates. 4,125,485, Cl. 252-546.000.
Lantos, Ivan: *See*—
Hill, David T.; Lantos, Ivan; and Sutton, Blaine M., 4,125,710, Cl. 536-121.000.
Hill, David T.; Lantos, Ivan; and Sutton, Blaine M., 4,125,711, Cl. 536-121.000.
Lasker, George, to General Dynamics Corporation. Armor. 4,125,053, Cl. 89-36.00A.
Laskowski, Kenneth W.: *See*—
Batchelor, Phillip J.; Gray, Gerald A., Jr.; Laskowski, Kenneth W.; and Wilczek, Stephen P., 4,125,325, Cl. 355-26.000.
Latash, Yury V.: *See*—
Medovar, Boris I.; Latash, Yury V.; Bogachenko, Alexsey G.; Kaganovsky, Gary P.; Leibenzon, Semen A.; Eltsov, Konstantin S.; Gabuev, Georgy K.; and Poticha, Zinoviy I., 4,125,145, Cl. 164-252.000.
Latty, James, to Rohm and Haas Company. Coated membranes. 4,125,462, Cl. 210-23.00F.
Laurer, George J.: *See*—
Cowardin, Robert L.; and Laurer, George J., 4,125,765, Cl. 235-463.000.
Laven, Merrill L. Swimming pool, and components thereof. 4,124,907, Cl. 4-172.190.
Lavigne, William J., Jr.; Agley, William; and Case, George M., to Carrier Corporation. Expansion device. 4,124,995, Cl. 62-224.000.
Law, Chi Y. Three dimension camera having a film holder. 4,125,849, Cl. 354-112.000.
Lawrence, Harold W.: *See*—
Hallman, Philip J.; and Lawrence, Harold W., 4,124,987, Cl. 405-276.000.
Lawrence Peska Associates, Inc.: *See*—
Embree, Milo J., 4,125,210, Cl. 222-570.000.
Laystall Engineering Company Limited: *See*—
Tanner, John E., 4,125,637, Cl. 427-198.000.
Leach, Bruce E., to Continental Oil Company. Method for the disproportionation of highly alkylated phenols with phenol. 4,125,736, Cl. 568-804.000.
Leary, Bruce: *See*—
Graetz, Clive W.; and Leary, Bruce, 4,125,677, Cl. 428-500.000.
Lechler Apparatebau KG: *See*—
Nieuwkamp, Wolfgang, 4,125,226, Cl. 239-468.000.
Lecloux, Andre; Kohler, Michel; and Dantinne, Paul, to Interox. Process for preparing epoxides. 4,125,543, Cl. 260-348.250.
Lederer, Edgar: *See*—
Audibert, Francoise; Lederer, Edgar; and Chedid, Louis, 4,125,603, Cl. 424-88.000.
Lee, Connie M. Combined cooking, draining and mashing device. 4,125,065, Cl. 99-348.000.
Lee, Denis C. External breast prosthesis. 4,125,117, Cl. 128-481.000.
Leenhouts, Albert C., to Superior Electric Company, The. Presettable number to step motor control system. 4,125,801, Cl. 318-696.000.
Lehmann, Joachim W.: *See*—
Beutler, Helmut; and Lehmann, Joachim W., 4,125,371, Cl. 8-176.000.
Lehoczky, Kenneth A.; and Edwards, Robert B., to GSE, Inc. Battery operated torque wrench with digital display. 4,125,016, Cl. 73-139.000.
Leibenzon, Semen A.: *See*—
Medovar, Boris I.; Latash, Yury V.; Bogachenko, Alexsey G.; Kaganovsky, Gary P.; Leibenzon, Semen A.; Eltsov, Konstantin S.; Gabuev, Georgy K.; and Poticha, Zinoviy I., 4,125,145, Cl. 164-252.000.
Leighton, Milton D.: *See*—
Bushnell, James D.; Glivicky, Alexandr P.; Leighton, Milton D.; and Sankey, Bruce M., 4,125,458, Cl. 208-309.000.
Leimala, Raimo J.; and Seilo, Matti, to Outukumpu OY. Removing zinc from a nickel solution by extraction. 4,125,587, Cl. 423-139.000.
Le Mehaute, Alain: *See*—
Bordet, Philippe; and Le Mehaute, Alain, 4,125,682, Cl. 429-104.000.
Lempa, Roman F., to Selas Corporation of America. Burner assembly. 4,125,359, Cl. 431-175.000.
Lenco, Inc.: *See*—
Blair, Bruce A., 4,124,944, Cl. 35-13.000.
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Cashel, Aloysius T.; Perna, Frank; Trussell, Gerald C.; D'Souza, Alfred C.; Karlin, Richard A.; Caruth, James R.; Van Ermen, Gary L.; Arnston, Robert W.; Comiskey, Gary F.; Borgens, Frederick R.; Kreft, Keith A.; Damm, Arthur; Sienaski, Dennis C.; Shepardson, Robert C.; Leung, Yam C.; and Jankowski, Thomas M., 4,125,894, Cl. 364-442.000.
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Levasseur, Joseph E. Four wheel drive stabilizer. 4,125,276, Cl. 280-718.000.
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Callingham, Martin, 4,125,600, Cl. 424-47.000.
Levinson, Lewis R. Cutting system with debris vacuuming means. 4,124,956, Cl. 51-273.000.
Lew, Hyok S. Quatrefoil connector connecting shelves. 4,125,338, Cl. 403-169.000.
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Lewis, David L.; Schenke, Larry A.; Suchanski, Mary R.; and Franks, C. Richard, deceased (by Yarcusko, Margaret S., executrix), to Diamond Shamrock Corporation. Transition metal oxide electrodes. 4,125,449, Cl. 204-290.00F.
LGZ Landis & Gyr Zug AG: *See*—
Nyfeler, Alex, 4,125,760, Cl. 219-388.000.
Li, Norman N., to Exxon Research & Engineering Co. Demulsification by centrifugation followed by strong shearing. 4,125,461, Cl. 210-22.00R.
Liberman, Harvey W.; Goranson, Paul L.; Ratledge, R. Houston, Jr.; and Salyers, John C., to Carrier Corporation. Methods for handling refuse containers. 4,125,196, Cl. 214-152.000.
Liebenow, Walter; and Prikryl, Jaroslav, to Ludwig Heumann & Co. GmbH. Process for the production of 2,4-diamino-5-(3',4',5'-trimethoxybenzyl)-pyrimidine. 4,125,721, Cl. 544-325.000.
Lienhard, Robert W., to Swiss Fabricating, Inc. Scaffolding for use in a confined area. 4,125,174, Cl. 182-128.000.
Limm, Albert C.: *See*—
O'Brien, James T.; Limm, Albert C.; Nyul, Paul; and Tassia, Vincent S., Jr., 4,125,777, Cl. 250-551.000.
Linbro Scientific, Inc.: *See*—
Liner, John, 4,125,436, Cl. 195-127.000.
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Sadjina, Heinz; and Veranneman, Georg, 4,124,997, Cl. 62-320.000.
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Abels, Theodor; Reissl, Manfred; and Muller, Willi, 4,125,199, Cl. 214-730.000.
Chmiel, Horst, 4,124,992, Cl. 62-74.000.
Forster, Franz, 4,125,058, Cl. 91-506.000.
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Linnerz, Wilhelm; Stodt, Eberhardt; and Kaldenbach, Erwin, 4,125,068, Cl. 100-19.00R.
Lindsley, John F., to American Cyanamid Company. Process for producing rare earth exchanged crystalline aluminosilicate. 4,125,591, Cl. 423-328.000.
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Habegger, Willie, deceased, 4,124,961, Cl. 52-592.000.
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Long, Olen R.: *See—*
Groves, David L., Sr.; Long, Olen R.; and McCoy, Billy G., 4,125,162, Cl. 166-314.000.
Loomis International, Inc.: *See—*
Rathburn, Lloyd C., 4,125,267, Cl. 277-188.00A.
L'Oreal: *See—*
Bugaut, Andree; and Vandenbossche, Jean-Jacques, 4,125,367, Cl. 8-11.000.
Bugaut, Andree; and Andrillon, Monique, 4,125,601, Cl. 424-71.000.
Los, Marinus, to American Cyanamid Company. Method of preparing imidazoisoindolediones. 4,125,727, Cl. 548-302.000.
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Brennan, James A.; and Lucki, Stanley J., 4,125,457, Cl. 208-254.00R.
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Liebenow, Walter; and Prikryl, Jaroslav, 4,125,721, Cl. 544-325.000.
Lukey, Leonard F., to Fifth Patroy Proprietary Limited. Retrovisors. 4,125,244, Cl. 248-475.00B.
Lundberg, Robert D.; and Makowski, Henry S., to Exxon Research & Engineering Co. Composition for fabrication of multiphase plastics from liquid suspension. 4,125,506, Cl. 260-30.60R.
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Ramey, Chester E.; and Luzzi, John J., 4,125,517, Cl. 260-45.80N.
Lynch, Gary J.: *See—*
Kidwell, Roger L.; and Lynch, Gary J., 4,125,567, Cl. 260-677.00R.
Lyons, Michael D.: *See—*
Olson, Paul E.; and Lyons, Michael D., 4,124,980, Cl. 60-700.000.
Lyons, Sanford C., to Yara Engineering Corporation. Kaolin product. 4,125,411, Cl. 106-291.000.
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Eakes, Marion L., 4,125,062, Cl. 98-115.0LH.
Macfield Texturing: *See—*
Dillon, Roy E., 4,125,229, Cl. 242-18.00R.
MacLean, Ewen M.; and Spector, George. Vertical take-off and landing (VTOL) aircraft with fixed horizontal variable-pitched rotors. 4,125,232, Cl. 244-12.300.
MacLennan, Donald J., to General Electric Company. Charge transfer memory apparatus. 4,125,785, Cl. 307-221.00D.
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Madsen, Thomas L. Apparatus for measuring thermal discomfort originating from asymmetry in the thermal field or variations with time of the thermal influence on the skin. 4,125,012, Cl. 73-15.00R.
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Nagamatsu, Kazuo; Yasuhara, Tadao; Oi, Masakazu; and Maeda, Hideaki, 4,125,805, Cl. 324-54.000.
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Fukuda, Shigeru; Narita, Satoru; Maejima, Makoto; and Homma, Masaru, 4,125,892, Cl. 364-200.000.
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Tsuchihashi, Michihiro; Saito, Masato; Yamanoshita, Makoto; Katsura, Hidetoshi; Myodo, Osamu; and Maeyama, Koichiro, 4,125,888, Cl. 362-231.000.
Magazzu, Joseph J., to Thiokol Corporation. Acrylated dithiocarbamyl esters. 4,125,671, Cl. 428-419.000.
Maguire, Eileen: *See—*
Donovan, Lawrence P.; Maguire, Eileen; and Kadison, Leon A., 4,125,649, Cl. 427-307.000.
Maier, George D.: *See—*
Goldhaft, Tevis M.; Kaitz, Charles; and Maier, George D., 4,125,628, Cl. 424-329.000.
Maier, Karl; and Hohn, Herbert, to L. Schuler GmbH. Workpiece turning device. 4,125,072, Cl. 100-207.000.
Maimets, Lembit. Collapsible tunnel liner section and method of lining a tunnel. 4,124,985, Cl. 405-150.000.
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Takeuchi, Yasuhisa; Maio, Kenji; and Matsumoto, Junichiro, 4,125,825, Cl. 340-52.00B.
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Radunz, Hans-Eckart; Orth, Dieter; Baumgarth, Manfred; Lissner, Reinhard; and Maisenbacher, Jurgen, 4,125,622, Cl. 424-276.000.
Makowski, Henry S.: *See—*
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Malinowski, William J., to Chloride, Incorporated. Smoke detector. 4,125,779, Cl. 340-630.000.
Mallinckrodt, Inc.: *See—*
Smith, Kenneth R., 4,125,709, Cl. 536-53.000.
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Malone, James E.: *See—*
Putnam, Cecil J., Jr.; and Malone, James E., 4,125,272, Cl. 280-478.00B.
Mani, Inder; and Peters, James, to Dow Chemical Company, The. Cement additives comprising a polymer latex containing a styrene-acrylate-acrylamide interpolymer and a butadiene rubber. 4,125,504, Cl. 260-29.70S.
Manley, Chester W., to Birka, John. Self-sealing bottle assembly and method for manufacture thereof. 4,125,200, Cl. 215-246.000.
Manning, Charles E.: *See—*
Phillips, Bobby M.; and Manning, Charles E., 4,124,924, Cl. 28-220.000.
MAPAL Fabrik fur Prazisionswerkzeuge Dr. Kress KG: *See—*
Kress, Dieter, 4,125,342, Cl. 408-179.000.
Marchetti, Alfred P.: *See—*
Tang, Ching W.; Marchetti, Alfred P.; and Young, Ralph H., 4,125,414, Cl. 136-89.0NB.
Marcinko, Andrew M.: *See—*
Huber, Joseph B.; and Marcinko, Andrew M., 4,125,007, Cl. 72-273.000.
Margolis, Joel, to Gradient Pty. Limited. Method and apparatus for simultaneously recording reaction times. 4,125,327, Cl. 356-39.000.
Maricle, Donald L.; and Nagle, Dennis C., to United Technologies Corp. Carbon foam fuel cell components. 4,125,676, Cl. 429-38.000.
Markovits, Gary, to International Business Machines Corporation. Method for non-destructive testing of semiconductor articles. 4,125,440, Cl. 204-1.00T.
Marshall, James F., to Honeywell Inc. Stress sensor apparatus. 4,125,820, Cl. 338-4.000.
Marshall, Rodney J.: *See—*
Fleischmann, Martin; Jansson, Robert E. W.; and Marshall, Rodney J., 4,125,439, Cl. 204-1.00R.
Marten, Rainer; and Schneider, Harald, to Gesellschaft fur Kernenergieverwertung in Schiffbau und Schiffahrt mbH. Apparatus for quantitative in-line X-ray fluorescence analysis of slurries. 4,125,769, Cl. 250-272.000.
Martens, Ernst, to Spiroll Corporation Ltd. Slip former with keyway forming assemblies. 4,125,348, Cl. 425-64.000.
Martin, Heinz: *See—*
Ziegler, Karl; Breil, Heinz; Martin, Heinz; and Holzkamp, Erhard, 4,125,698, Cl. 526-159.000.
Martin Marietta Corporation: *See—*
Graham, Lawrence H., 4,125,808, Cl. 325-55.000.
Martin, Peter G., to Arthur D. Little, Inc. Portable data entry device. 4,125,871, Cl. 364-900.000.
Martin, Ralph E.: *See—*
Mazur, Richard A.; and Martin, Ralph E., 4,125,831, Cl. 340-347.0AD.
Martin, William R., to General Wadsworth Brick Corp. Cutter wire and cushion block assembly for a brick-cutting machine. 4,125,047, Cl. 83-581.100.
Martinez, Carlos J.: *See—*
McCarty, William H.; and Martinez, Carlos J., 4,125,503, Cl. 260-29.7NR.
Martino, Germain: *See—*
Trin Dinh, Chan; Le Page, Jean-Francois; Cosyns, Jean; Martino, Germain; and Miquel, Jean, 4,125,566, Cl. 260-676.00R.
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Erickson, Erick E., 4,125,262, Cl. 273-101.000.
Terzian, Rouben T., 4,124,952, Cl. 46-44.000.
Masahiro, Satomi: *See—*
Kamei, Mitsuru; Osamu, Uno; Toru, Ogawa; Yoichiro, Ishii; and Masahiro, Satomi, 4,125,021, Cl. 73-304.00R.
Masoneilan International, Inc.: *See—*
Baumann, Hans D., 4,125,129, Cl. 137-625.300.
Masri, Merle S.; and Randall, Virginia G., to United States of America, Agriculture. Chitosan modified with anionic agent and glutaraldehyde. 4,125,708, Cl. 536-20.000.
Master Pneumatic-Detroit, Inc.: *See—*
Thrasher, George E., Jr., 4,125,176, Cl. 184-56.00A.
Masuda, Mitsuo: *See—*
Kinoshita, Toshiharu; Shinoda, Yoshio; Oyamada, Takashi; Masuda, Mitsuo; and Arai, Noritomo, 4,125,749, Cl. 179-99.000.
Masuda, Noboru, to Denki Onkyo Company, Limited. Potentiometer providing a non-linear output. 4,125,821, Cl. 338-32.00R.
Masuda, Takao: *See—*
Ikenoue, Shinpei; Katsuyama, Harumi; and Masuda, Takao, 4,125,403, Cl. 96-114.100.
Masunaga, Kunihiko; Kani, Masakatsu; Hoshi, Hirohiko; and Ishiguro, Kazuhiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Control method and system for car-mounted fuel reformer. 4,125,090, Cl. 123-3.000.

Masunaga, Kunihiko: *See*—
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Matics, John R.: *See*—
Krezak, John E.; and Matics, John R., 4,125,029, Cl. 74-13.000.

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Hirasawatsu, Tetsuo; and Matsueda, Takashi, 4,124,999, Cl. 64-17.00R.

Matsui, Katsuaki: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Osawa, Hisayou, 4,125,533, Cl. 546-19.000.

Matsui, Kunio: *See*—
Hosaka, Yukio; Matsui, Kunio; and Yamamoto, Tomio, 4,125,889, Cl. 362-253.000.

Matsui, Toshio; and Kitou, Nobuo, to Minolta Camera Kabushiki Kaisha. Heat roller and toner image fixing device made therewith. 4,125,362, Cl. 432-60.000.

Matsumoto, Ikuo: *See*—
Hidaka, Hiroyoshi; Matsumoto, Ikuo; Ito, Yoshiaki; and Aoki, Nobuo, 4,125,730, Cl. 560-37.000.

Matsumoto, Jun-ichi, to Dainippon Pharmaceutical Co., Ltd. 2-[4-(p-Aminobenzyl)-1-piperazinyl]-8-ethyl-5,8-dihydro-5-oxopyrido[2,3-d]pyrimidine-6-carboxylic acid, its pharmaceutically acceptable salt, process for its production and use thereof. 4,125,615, Cl. 424-251.000.

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Takeuchi, Yasuhisa; Maio, Kenji; and Matsumoto, Junichiro, 4,125,825, Cl. 340-52.00B.

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Matsumoto, Shigeto, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Climbing device for climbing crane. 4,125,193, Cl. 212-64.000.

Matsumura, Hideki: *See*—
Iwasaki, Takao; Hirano, Junji; and Matsumura, Hideki, 4,125,564, Cl. 260-655.000.

Matsuo, Masayoshi: *See*—
Kizu, Fumio; Hanano, Kazuyoshi; Sotoyama, Kaoru; and Matsuo, Masayoshi, 4,125,399, Cl. 75-125.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Ohashi, Tokuyoshi; Matuda, Akira; and Horii, Hiroshi, 4,125,356, Cl. 431-76.000.
Watanabe, Jun; Ohta, Akira; and Kobayashi, Shigeo, 4,125,638, Cl. 429-199.000.

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Kakuchi, Masami; Sugawara, Shungo; Murase, Kei; and Matsuyama, Kentaro, 4,125,672, Cl. 428-421.000.

Matthes, John A. Protective head gear. 4,124,904, Cl. 2-413.000.

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Ohashi, Tokuyoshi; Matuda, Akira; and Horii, Hiroshi, 4,125,356, Cl. 431-76.000.

Maure, Douglas R.: *See*—
Brooks, James G., Jr.; Maure, Douglas R.; and Meijer, Christoffel H., 4,125,432, Cl. 176-22.000.

Maurer, Fritz: *See*—
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, 4,125,609, Cl. 424-200.000.

Mausberg, Hans: *See*—
Burger, Klaus; Mausberg, Hans; and Tengler, Hubert, 4,125,464, Cl. 210-31.00C.

Mautner, Edward J. Fishing device for automatically setting a fish hook. 4,124,948, Cl. 43-15.000.

Maxwell, Ian E., to Shell Oil Company. Process for reactivating used silver ethylene oxide catalysts. 4,125,480, Cl. 252-414.000.

Maxwell, Ronald K., to Racal-Vadic, Inc. Multiline automatic calling system adapter. 4,125,872, Cl. 364-900.000.

May, Michael G. Four cycle internal combustion engine. 4,125,105, Cl. 123-191.00L.

Mayer, Norbert; Pfahler, Gerhard; and Scheidl, Franz, to Hoechst Aktiengesellschaft. Cyclic phosphites of sugar alcohols and polymers stabilized therewith. 4,125,500, Cl. 260-23.00H.

Mayer, Norbert: *See*—
Haberlein, Harald; Mayer, Norbert; and Pfahler, Gerhard, 4,125,501, Cl. 260-23.00H.

Mayo, John D.; and Kalnin, Laurence N., to Cecil E. Mayo Pty. Ltd. Tourniquet. 4,125,115, Cl. 128-327.000.

Mazur, Richard A.; and Martin, Ralph E., to Continental Can Company, Inc. Self-contained data acquisition device. 4,125,831, Cl. 340-347.0AD.

McArthur, James A. Limb exercising apparatus. 4,125,258, Cl. 272-118.000.

McCarty, William H.; and Martinez, Carlos J., to Mobil Oil Corporation. Ultraviolet curing emulsion systems. 4,125,503, Cl. 260-29.7NR.

McCleary, Rex: *See*—
Hruby, John F.; McCleary, Rex; O'Hogan, Jerome M.; and Searle, Nathan H., 4,125,868, Cl. 364-900.000.

McClure, Charles L., to Pro-Tech, Inc. Flow monitoring. 4,125,020, Cl. 73-215.000.

McCoy, Billy G.: *See*—
Groves, David L., Sr.; Long, Olen R.; and McCoy, Billy G., 4,125,162, Cl. 166-314.000.

McCoy, Frederic C.: *See*—
Kolaian, Jack H.; McCoy, Frederic C.; and Patterson, John A., 4,125,475, Cl. 252-89.00R.

McCready, John E., to Goodyear Aerospace Corporation. Vacuum blanket curing method. 4,125,526, Cl. 264-90.000.

McDonnell Douglas Corporation: *See*—
Dhuyvetter, Henry J.; Engelder, Paul D.; and Simmons, Joseph C., 4,125,017, Cl. 73-178.00R.
Harduvel, John T., 4,125,799, Cl. 318-621.000.

McEvoy, Francis J.; and Albright, Jay D., to American Cyanamid Company. 2-Aryloxy-2-(phenoxyalkoxy)phenyl acetic acid and esters. 4,125,732, Cl. 560-62.000.

McEvoy, Francis J.: *See*—
Trust, Ronald I.; McEvoy, Francis J.; and Albright, Jay D., 4,125,729, Cl. 560-9.000.

McGee, John K.; and Lane, Floyd J., to Combustion Engineering, Inc. Damped fluid pressure valve operator with selective back seat. 4,125,060, Cl. 92-59.000.

McGinnis, Stephen B., to Raybestos-Manhattan, Inc. Friction material. 4,125,496, Cl. 260-17.4BB.

McKenny, Vernon G.; and Chan, Tsiu C., to Mostek Corporation. Symmetrical cell layout for static RAM. 4,125,854, Cl. 357-41.000.

McLean, Donald F.: *See*—
Hounsfield, Godfrey N.; and McLean, Donald F., 4,125,858, Cl. 358-82.000.

McLeod, Paul S.: *See*—
Hartsough, Larry D.; and McLeod, Paul S., 4,125,446, Cl. 204-192.00P.

McNeil Laboratories, Incorporated: *See*—
Carmosin, Richard J., 4,125,537, Cl. 260-326.200.

McPherson, Ernest W.; and Barss, Jonn C., to Barmac Electronics. Alarm circuit. 4,125,824, Cl. 340-52.00D.

McQuay-Perfex Inc.: *See*—
Cornelius, Richard T.; and Erickson, Charles G., 4,124,994, Cl. 62-138.000.

McWhinnie, John: *See*—
Bagshaw, Norman E.; and McWhinnie, John, 4,125,690, Cl. 429-226.000.

Mead, Graham E.: *See*—
Harris, John D.; Fogden, Michael F.; and Mead, Graham E., 4,125,169, Cl. 180-6.500.

Med-El Inc.: *See*—
Resnick, Jerome B.; and Combs, John W., 4,125,828, Cl. 340-146.3CA.

Medovar, Boris I.; Latash, Yury V.; Bogachenko, Alexsey G.; Kaganovsky, Gary P.; Leibenzon, Semen A.; Eltsov, Konstantin S.; Gabuev, Georgy K.; and Poticha, Zinoviy I., to Institut Elektrosvarki Im. I.O. Patona. Electroslag remelting furnace start-up apparatus. 4,125,145, Cl. 164-252.000.

Meenen, Raymond P.: *See*—
Vecchiotti, Camillo M.; and Meenen, Raymond P., 4,125,424, Cl. 156-550.000.

Meierhoefer, Eugene J., to Warner-Lambert Company. Pharmaceutical delivery system. 4,125,186, Cl. 206-221.000.

Meijer, Christoffel H.: *See*—
Brooks, James G., Jr.; Maure, Douglas R.; and Meijer, Christoffel H., 4,125,432, Cl. 176-22.000.

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Araujo, Roger J.; Borrelli, Nicholas F.; Chodak, Jan B.; Hares, George B.; Meiling, Gerald S.; and Seward, Thomas P., III, 4,125,404, Cl. 106-54.000.
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Memorex Corporation: *See*—
Rolph, Donald L., 4,125,883, Cl. 360-99.000.

Merck & Co., Inc.: *See*—
Baldwin, John J.; and Novello, Frederick C., 4,125,530, Cl. 546-167.000.
Baldwin, John J., 4,125,618, Cl. 424-265.000.
Grier, Nathaniel; and Witzel, Bruce E., 4,125,719, Cl. 544-215.000.
Sinha, Rabindra K., 4,125,482, Cl. 252-447.000.

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Radunz, Hans-Eckart; Orth, Dieter; Baumgarth, Manfred; Lissner, Reinhard; and Maisenbacher, Jurgen, 4,125,622, Cl. 424-276.000.

Merrow, Thomas E.; Hamilton, Stephen P.; Miles, Larry L.; and Grant, Charles P., Jr., deceased (by Grant, Charles P., Sr., executor), to Texas Instruments Incorporated. Electronic calculator or microprocessor having a multi-input arithmetic unit. 4,125,901, Cl. 364-736.000.

Mertes, Paul M. Universal drawer slider. 4,125,297, Cl. 308-3.600.

Messer Griesheim GmbH: *See*—
Herbener, Klaus; and Schmunck, Karlheinz, 4,125,250, Cl. 266-50.000.

Messerschmidt, Harold J., Jr.; and Heyman, Karl, to Mona Industries, Inc. Laminated plates for chemical milling. 4,125,661, Cl. 428-201.000.

Messner, Daryle: *See*—
Genest, Leonard J.; and Messner, Daryle, 4,125,008, Cl. 70-279.000.

Messrs. Willibald Grammer: *See*—
Meiller, Hermann; and Daunderer, Heinz, 4,125,242, Cl. 248-399.000.

Metallgesellschaft AG: *See*—
Hilterhaus, Karl-Heinz, 4,125,693, Cl. 521-63.000.
Metcalf, William T., to Hentschel Instruments, Inc. Digital normalizing circuit. 4,125,896, Cl. 364-606.000.
Michaels, Paul A.: *See*—
Bode, James D.; Wolber, William G.; Michaels, Paul A.; and Ahern, Charles J., 4,125,374, Cl. 23-232.00E.
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Jackson, Lynden A.; and Midwinter, John E., 4,125,768, Cl. 250-227.000.
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Sowman, Harold G., 4,125,406, Cl. 106-57.000.
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Ikeda, Hiroshi; Doi, Yasuhiko; and Hayashi, Masamichi, 4,125,323, Cl. 355-8.000.
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Miquel, Jean: *See*—
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Mishina, Haruo: *See*—
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Ikebata, Shigeki; Fujino, Junichi; and Miyazaki, Hideto, 4,125,795, Cl. 315-368.000.
Tsuchihashi, Michihiro; Saito, Masato; Yamanoshita, Makoto; Katsura, Hidetoshi; Myodo, Osamu; and Maeyama, Koichiro, 4,125,888, Cl. 362-231.000.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Sugio, Akitoshi; Takeda, Mutsuhiko; Mizutani, Makoto; and Suzumori, Takeo, 4,125,540, Cl. 260-340.000.
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Kiyota, Yuhiko, 4,125,098, Cl. 123-119.0LR.
Nakamura, Hirokazu; and Motoyama, Hikoichi, 4,125,036, Cl. 74-604.000.
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Hiramatsu, Takeo, 4,125,038, Cl. 74-869.000.
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Kamio, Takayoshi; and Miyamoto, Akio, 4,125,636, Cl. 427-150.000.
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Ikebata, Shigeki; Fujino, Junichi; and Miyazaki, Hideto, 4,125,795, Cl. 315-368.000.
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Braid, Milton, 4,125,472, Cl. 252-32.500.
Brennan, James A.; and Lucki, Stanley J., 4,125,457, Cl. 208-254.00R.
Jackson, Steven M., 4,125,569, Cl. 260-683.900.
McCarty, William H.; and Martinez, Carlos J., 4,125,503, Cl. 260-29.7NR.
Theriot, Walter A.; Saucier, Steven D.; and Drinkard, B. M., 4,125,568, Cl. 260-681.500.
Waite, Jerry M.; Burdyn, Ralph F.; and Savins, Joseph G., 4,125,158, Cl. 166-273.000.
Weiner, Milton L.; Breidt, Peter, Jr.; and Higgins, Thomas W., 4,125,662, Cl. 428-213.000.
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Mohammadioun, Said, to Lanier Business Products, Inc. Recording system. 4,125,865, Cl. 360-32.000.
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Kohl, Wilhelm; Eibner, Robert; Nolle, Hans-Heinrich; Schneider, Alfred; and Moldovany, Nikolaus-Johann, 4,125,393, Cl. 71-3.000.
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Mona Industries, Inc.: *See*—
Messerschmidt, Harold J., Jr.; and Heyman, Karl, 4,125,661, Cl. 428-201.000.
Monarch Marking Systems, Inc.: *See*—
Hamisch, Paul H., Jr., 4,125,419, Cl. 156-277.000.
Hamisch, Paul H., Jr., 4,125,420, Cl. 156-384.000.
Hamisch, Paul H., Jr., 4,125,421, Cl. 156-384.000.
Jenkins, William A., 4,125,215, Cl. 227-67.000.
Mong, William K.: *See*—
Elward, Michael P.; and Mong, William K., 4,125,128, Cl. 137-596.000.
Monitek, Inc.: *See*—
Cushing, Vincent J., 4,125,019, Cl. 73-194.0EM.
Monitron Industries, Inc.: *See*—
Genest, Leonard J.; and Messner, Daryle, 4,125,008, Cl. 70-279.000.
Monks, Harry, to Coal Industry (Patents) Limited. Drive mechanism. 4,125,178, Cl. 192-18.00A.
Monma, Yoshinobu: *See*—
Inayoshi, Katsuyuki; and Monma, Yoshinobu, 4,125,426, Cl. 156-656.000.
Monsanto Company: *See*—
Hill, James C.; and Knox, Walter R., 4,125,488, Cl. 521-128.000.
Hill, James C.; and Knox, Walter R., 4,125,511, Cl. 260-40.00R.
Hill, James C.; and Knox, Walter R., 4,125,520, Cl. 260-830.0TW.
Hill, James C.; and Knox, Walter R., 4,125,524, Cl. 528-366.000.
Kidwell, Roger L.; and Lynch, Gary J., 4,125,567, Cl. 260-677.00R.
Kruse, Robert L., 4,125,573, Cl. 260-876.00R.
Lannert, Kent P., 4,125,485, Cl. 252-546.000.
Moore Company, The: *See*—
Moore, Junius T., Jr., 4,125,241, Cl. 248-320.000.
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Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Osawa, Hisayou, 4,125,533, Cl. 546-19.000.
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Moriya, Yoshiaki: *See*—
Suzuki, Seigo; and Moriya, Yoshiaki, 4,125,870, Cl. 364-900.000.
Morman, Raymond A.; and Duchane, David V., to Kimberly-Clark Corporation. Applicator for inserting hygienic media into body cavities. 4,125,113, Cl. 128-260.000.
Morozumi, Shinji, to Orient Watch Co., Ltd. Calendar watch. 4,124,975, Cl. 58-58.000.
Morris, Alan J.: *See*—
Rado, Theodore A.; and Morris, Alan J., 4,125,385, Cl. 55-269.000.
Morris, Alberto J. Exhaust gas silencer. 4,125,171, Cl. 181-265.000.
Morris, Earl F.: *See*—
Crinkelmeyer, Oliver W.; and Morris, Earl F., 4,125,160, Cl. 166-293.000.
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Chambers, Ramon P.; Gordy, Robert S.; Sanders, David E.; and Morrison, Cameron E., 4,125,764, Cl. 235-302.000.

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Schwan, Thomas J.; and Goldenberg, Marvin M., 4,125,529, Cl. 546-90.000.
Mostek Corporation: *See—*
McKenny, Vernon G.; and Chan, Tsiu C., 4,125,854, Cl. 357-41.000.
Motorola, Inc.: *See—*
Clark, Lowell E., 4,125,415, Cl. 148-1.500.
Gordon, Frank J., 4,125,028, Cl. 74-10.00R.
Gunderson, Philip D., 4,125,097, Cl. 123-117.00R.
Jellissen, Roy H., 4,124,936, Cl. 29-602.00R.
Reinert, John R., 4,125,877, Cl. 365-190.000.
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Nakamura, Hirokazu; and Motoyama, Hikoichi, 4,125,036, Cl. 74-604.000.
Mott, Murray H., to United States of America, Navy. Digital C/kT meter. 4,125,809, Cl. 325-363.000.
Mounts, Frank W.; Netravali, Arun N.; and Prasada, Birendra, to Bell Telephone Laboratories, Incorporated. Video signal encoding. 4,125,861, Cl. 358-133.000.
Mt. Sinai School of Medicine of the City University of New York: *See—*
Orlowski, Marian; and Wilk, Sherwin, 4,125,626, Cl. 424-319.000.
Muckle Manufacturing Division Builders Iron Products, Inc.: *See—*
Salmonsen, Greg C.; and Pfieffer, David C., 4,125,084, Cl. 116-99.000.
Mueller, Richard A., to G. D. Searle & Co. 1-[5-(2-Azabicyclo[2.2.-2]oct-2-ylpentanoyl]-2-(dibenz-oxazepine-10-carbonyl)hydrazines. 4,125,532, Cl. 260-244.400.
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Muller, Ernst; and Trautwein, Adolf. Continuous casting processes and apparatus. 4,125,146, Cl. 164-437.000.
Muller, Willi: *See—*
Abels, Theodor; Reissl, Manfred; and Muller, Willi, 4,125,199, Cl. 214-730.000.
Mumber, Richard A.: *See—*
Bemmels, Cyrus W.; Mumber, Richard A.; and Schirripa, Thomas J., 4,125,665, Cl. 428-352.000.
Munk, Benedikt A., to Ohio State University Research Foundation. Space filter. 4,125,841, Cl. 343-909.000.
Murakami, Hiroyasu: *See—*
Shinoda, Nobuhiko; Sakurada, Nobuaki; Ito, Tadashi; Yamamichi, Masayoshi; Murakami, Hiroyasu; and Suzuki, Masayuki, 4,125,832, Cl. 340-347.0DD.
Murakami, Yasukazu; Kubo, Masayoshi; and Watanabe, Shoji, to Daicel Ltd. Process for preparing alkyd resins. 4,125,521, Cl. 528-274.000.
Murasaki, Akira: *See—*
Otsubo, Kizuku; Murasaki, Akira; and Kita, Takehiko, 4,125,096, Cl. 123-117.00A.
Murase, Kei: *See—*
Kakuchi, Masami; Sugawara, Shungo; Murase, Kei; and Matsuyama, Kentaro, 4,125,672, Cl. 428-421.000.
Murata, Kazuo; and Kito, Terukazu, to Oki Electric Industry Co., Ltd. High speed pulse interpolator. 4,125,897, Cl. 364-702.000.
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Osawa, Hisayou, to Sankyo Co. Ltd. Piperidine derivatives. 4,125,533, Cl. 546-19.000.
Murogov, Viktor M.: *See—*
Iljunin, Vladimir G.; Murogov, Viktor M.; Troyanov, Mikhail F.; Rineisky, Anatoly A.; and Shmelev, Anatoly N., 4,125,433, Cl. 176-68.000.
Murphy, Clarence R.: *See—*
Boehme, Robert E.; and Murphy, Clarence R., 4,125,584, Cl. 264-142.000.
Murphy, Donald W.: *See—*
Di Salvo, Francis J., Jr.; and Murphy, Donald W., 4,125,687, Cl. 429-194.000.
Murray, Frank J.: *See—*
White, John R.; Murray, Frank J.; and Becht, Cletus A., 4,125,660, Cl. 428-218.00A.
Muschaweck, Roman: *See—*
Lang, Hans-Jochen; and Muschaweck, Roman, 4,125,614, Cl. 424-251.000.
Muzik, Glenn M. Graphic laminate and method of making same. 4,125,653, Cl. 428-40.000.
Myodo, Osamu: *See—*
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N L Industries, Inc.: *See—*
Kroplinski, Thaddeus F.; and Brauer, Melvin, 4,125,545, Cl. 260-404.500.
Nagai, Yasuhiro: *See—*
Oishi, Minoru; Hirakoso, Keiichiro; Iio, Katsuro; Nagai, Yasuhiro; and Nariai, Tetsurou, 4,125,758, Cl. 219-126.000.
Nagamatsu, Kazuo; Yasuhara, Tadao; Oi, Masakazu; and Maeda, Hideaki, to Takeda Chemical Industries, Ltd. Method and apparatus for defect inspection of liquid-filled insulating container. 4,125,805, Cl. 324-54.000.
Nagase, Hiroshi; Okuyama, Toshiaki; Kubota, Yuzuru; and Suzuki, Katsunori, to Hitachi, Ltd. Control apparatus for use in a synchronous machine. 4,125,796, Cl. 318-175.000.
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Maricle, Donald L.; and Nagle, Dennis C., 4,125,676, Cl. 429-38.000.
Nahabedian, Charles E.; VanOrnum, James H.; Wang, Tse-Lin; and Weiss, Carl D., to Bell Telephone Laboratories, Incorporated. Communication system call transfer arrangement. 4,125,748, Cl. 179-18.0BD.
Naida, Tatyana B.: *See—*
Ryabenko, Evgeny A.; Bljum, Grigory Z.; Naida, Tatyana B.; Golub, Alexandr E.; Galchina, Natalya I.; Aronov, Alexandr R.; Semenova, Natalya F.; Raginskaya, Ljudmila K.; and Vonsovsky, Alexandr M., 4,125,596, Cl. 423-522.000.
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Yamade, Hirotada; Nakagome, Takenari; and Komatsu, Toshiaki, 4,125,611, Cl. 424-246.000.
Nakamoto, Soichi; Ito, Fumio; Isobe, Yasuo; and Ito, Tadashi, to Canon Kabushiki Kaisha. Electronic exposure control apparatus. 4,125,846, Cl. 354-23.00D.
Nakamoto, Soichi: *See—*
Ito, Tadashi; Ito, Fumio; Nakamoto, Soichi; and Isobe, Yasuo, 4,125,848, Cl. 354-29.000.
Nakamua, Tamotsu: *See—*
Kawamoto, Junichi; Ito, Yasuo; Ito, Akio; Nakamua, Tamotsu; Nakamura, Motoyuki; Yamaoto, Yoshiaki; and Yonekura, Koji, 4,125,144, Cl. 164-4.000.
Nakamura, Hirokazu; and Motoyama, Hikoichi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Apparatus for driving engine balancers. 4,125,036, Cl. 74-604.000.
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Nakamura, Katori; and Nakamura, Hisako. Lock device of the pushbutton system. 4,125,005, Cl. 70-133.000.
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Kawamoto, Junichi; Ito, Yasuo; Ito, Akio; Nakamua, Tamotsu; Nakamura, Motoyuki; Yamaoto, Yoshiaki; and Yonekura, Koji, 4,125,144, Cl. 164-4.000.
Nakamura, Nobutaka; and Saeki, Yukio, to Sumitomo Durez Company, Ltd. Polyvinyl acetate-modified phenolic resin composition. 4,125,502, Cl. 260-29.300.
Narayan, Thirumurti; and Cenker, Moses, to BASF Wyandotte Corporation. Novel prepolymers, flame retardant interpolymers prepared therefrom, and processes for the preparation thereof. 4,125,489, Cl. 521-136.000.
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Oishi, Minoru; Hirakoso, Keiichiro; Iio, Katsuro; Nagai, Yasuhiro; and Nariai, Tetsurou, 4,125,758, Cl. 219-126.000.
Narita, Satoru: *See—*
Fukuda, Shigeru; Narita, Satoru; Maejima, Makoto; and Homma, Masaru, 4,125,892, Cl. 364-200.000.
Nastasic, Vladimir: *See—*
Watson, Donald M.; and Nastasic, Vladimir, 4,124,989, Cl. 405-225.000.
National Research Development Corporation: *See—*
Fleischmann, Martin; Jansson, Robert E. W.; and Marshall, Rodney J., 4,125,439, Cl. 204-1.00R.
Haken, Roger A.; Roberts, Peter C. T.; Taylor, Robert G.; and Traynar, Christopher P., 4,125,818, Cl. 333-70.00T.
Hallman, Philip J.; and Lawrence, Harold W., 4,124,987, Cl. 405-276.000.
Harris, John D.; Fogden, Michael F.; and Mead, Graham E., 4,125,169, Cl. 180-6.500.
Hunter, William M., 4,125,375, Cl. 23-230.00B.
Rodgers, John L.; and Schofield, David, 4,125,879, Cl. 365-236.000.
National Semiconductor Corporation: *See—*
Gutmann, Manfred, 4,125,869, Cl. 364-900.000.
National Starch and Chemical Corporation: *See—*
Schoenberg, Jules E.; and Ray-Chaudhuri, Dilip K., 4,125,494, Cl. 260-17.00A.
National Steel Corporation: *See—*
Vierbicky, Van L., 4,125,024, Cl. 73-425.40R.
Natsuume, Tadao, to Nippon Zeon Co., Ltd. Water-reducing admixture. 4,125,410, Cl. 106-90.000.
NCR Corporation: *See—*
Betts, William L., 4,125,900, Cl. 364-724.000.
Chen, Peter C.; Stewart, John K., Jr.; and Koo, Tuh-Kai, 4,125,427, Cl. 156-657.000.
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Hudspeth, Emmett L.; Richardson, Philip C.; Neathery, John L., Jr.; Dykstra, Jerald P.; Boger, Allen D., Jr.; Sims, William B., Jr.; Hunt, Glenn E.; and Quisenberry, Tony M., 4,125,111, Cl. 128-2.05T.
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Negola, Carmine. Pollution control device. 4,125,380, Cl. 422-180.000.
Nelson, John W., to Oliver Machinery Company. Roll through billet heater. 4,125,365, Cl. 432-152.000.
Nelson, Norman A., to Upjohn Company, The. Certain 5,6-dihydraprostacyclin analogs. 4,125,713, Cl. 542-426.000.
NET Systems Inc.: *See—*
Erwin, Robert C., 4,125,771, Cl. 250-277.00R.
Netravali, Arun N.; and Rubinstein, Charles B., to Bell Telephone Laboratories, Incorporated. Digital encoding and decoding of color video signals. 4,125,856, Cl. 358-13.000.

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Cummings, David G., 4,124,918, Cl. 16-93.00D.

Newton, Barry N., to Alcon Laboratories, Inc. Iodinated thiolcarbonates and method for use as radiographic contrast agents. 4,125,554, Cl. 260-455.00B.

Nicely, Thomas E.: *See—*
Kelly, Calvin E.; and Nicely, Thomas E., 4,125,438, Cl. 202-248.000.

Nicholas, Keith H., to U.S. Philips Corporation. Methods of manufacturing semiconductor devices. 4,124,933, Cl. 29-578.000.

Nichols, Michael J., to Thermal Syndicate Limited. Thermocouple element. 4,125,738, Cl. 136-234.000.

Nicol, Charles H., to Procter & Gamble Company, The. Laundry method imparting soil release properties to laundered fabrics. 4,125,370, Cl. 8-137.500.

Nicolas, Edgard: *See—*
Degueldre, Louis; and Nicolas, Edgard, 4,125,450, Cl. 204-296.000.

Nicolas, Yves; and Tromelin, Jacques, to Schlumberger Technology Corporation. Anchoring apparatus for tools used in determining the stuck point of a conduit in a borehole. 4,125,013, Cl. 73-151.000.

Nielsen, Arnold T., to United States of America, Navy. Method for preparing 2,3,7,8-tetraazaspiro[4,4]nona-2,7-diene. 4,125,728, Cl. 548-356.000.

Nieuwkamp, Wolfgang, to Lechler Apparatebau KG. Hollow cone nozzle for atomization of liquids. 4,125,226, Cl. 239-468.000.

Nifco, Inc.: *See—*
Tanaka, Toshie, 4,125,238, Cl. 248-56.000.

Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.): *See—*
Abe, Masao, 4,125,847, Cl. 354-25.000.

Niimi, Yuji: *See—*
Torii, Kyozo; Koshino, Kenji; Niimi, Yuji; Ogawa, Mashahiro; and Kamo, Keizo, 4,125,026, Cl. 74-713.000.

Nippon Air Brake Co., Ltd., The: *See—*
Tuji, Hirokazu, 4,125,059, Cl. 92-51.000.

Nippon Electric Co., Ltd.: *See—*
Watanabe, Hiroshi, 4,125,878, Cl. 365-208.000.

Nippon Kokan Kabushiki Kaisha: *See—*
Hosaka, Yukio; Matsui, Kunio; and Yamamoto, Tomio, 4,125,889, Cl. 362-253.000.

Nippon Soken, Inc.: *See—*
Noguchi, Masaaki; Tanaka, Yukiyasu; and Tanaka, Taro, 4,125,094, Cl. 123-32.0ST.
Tanaka, Eizi; Ohashi, Michihiro; Mochizuki, Hiroshi; and Nishimatsu, Akira, 4,125,102, Cl. 123-139.0AW.

Nippon Steel Corporation: *See—*
Katoh, Hiroshi; Onoe, Yasumitsu; Kawamura, Koichi; and Akisue, Osamu, 4,125,416, Cl. 148-12.00F.

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Fukuda, Shigeru; Narita, Satoru; Maejima, Makoto; and Homma, Masaru, 4,125,892, Cl. 364-200.000.
Ishii, Akira; Kishino, Fumio; and Yamagishi, Kingo, 4,125,860, Cl. 358-128.000.
Kakuchi, Masami; Sugawara, Shungo; Murase, Kei; and Matsuyama, Kentaro, 4,125,672, Cl. 428-421.000.

Nippon Zeon Co., Ltd.: *See—*
Joh, Yasushi; and Yamazaki, Masahiro, 4,125,468, Cl. 210-321.00B.
Natsuume, Tadao, 4,125,410, Cl. 106-90.000.

Nisco Kabushiki Kaisha: *See—*
Kamei, Mitsuru; Osamu, Uno; Toru, Ogawa; Yoichiro, Ishii; and Masahiro, Satomi, 4,125,021, Cl. 73-304.00R.

Nisenbaum, Yakov A.: *See—*
Buzhinsky, Vladimir L.; Raschepkin, Konstantin E.; Dunjushkin, Mikhail G.; Lysogorsky, Gennady T.; Valeev, Rustem I.; Nisenbaum, Yakov A.; and Ikhsanov, Deviz F., 4,124,914, Cl. 15-93.00R.

Nishimatsu, Akira: *See—*
Tanaka, Eizi; Ohashi, Michihiro; Mochizuki, Hiroshi; and Nishimatsu, Akira, 4,125,102, Cl. 123-139.0AW.

Nissan Motor Company, Limited: *See—*
Akiyama, Yoshinori; Kurami, Kenshi; Takeshita, Junichiro; and Furuya, Takeo, 4,125,277, Cl. 280-745.000.
Kobayashi, Yasushi; and Ito, Akira, 4,125,133, Cl. 139-435.000.
Otsubo, Kizuku; Murasaki, Akira; and Kita, Takehiko, 4,125,096, Cl. 123-117.00A.
Takeuchi, Yasuhisa; Maio, Kenji; and Matsumoto, Junichiro, 4,125,825, Cl. 340-52.00B.

Nitivy Co., Ltd.: *See—*
Uzumaki, Mitsutaka; Takashio, Masahiko; and Utsumi, Tadayoshi, 4,125,486, Cl. 521-32.000.

Nixon, Roy A., Jr., to Corning Glass Works. Parabolic reflector including filament locating means. 4,125,890, Cl. 362-348.000.

NL Industries, Inc.: *See—*
Brock, Bill M., Jr., 4,125,155, Cl. 166-97.000.

Noel, Leon: *See—*
Wasserman, Rene; Quaas, Joseph; Chalard, Jean-Claude; Noel, Leon; and Steine, Hans-Theo, 4,125,754, Cl. 219-121.00P.

Nogami, Tomoyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic brake pressure control apparatus for use with a vehicle. 4,125,291, Cl. 303-24.00F.

Noguchi, Masaaki; Tanaka, Yukiyasu; and Tanaka, Taro, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Nippon Soken, Inc. Internal combustion engine with an auxiliary combustion chamber. 4,125,094, Cl. 123-32.0ST.

Nolle, Hans-Heinrich: *See—*
Kohl, Wilhelm; Eibner, Robert; Nolle, Hans-Heinrich; Schneider, Alfred; and Moldovany, Nikolaus-Johann, 4,125,393, Cl. 71-3.000.

Norris, John B.: *See—*
Parrott, George A.; and Norris, John B., 4,125,227, Cl. 241-186.00R.

Northern Telecom Limited: *See—*
Jukes, John A.; Pound, Thomas C.; and Cascarano, Wayne A., 4,125,645, Cl. 427-117.000.
King, Frederick D., 4,125,389, Cl. 65-3.00A.

Nothen, Karl: *See—*
Pettelkau, Hans-Jurgen; Ehrig, Bodo; Nothen, Karl; and Rosahl, Dietrich, 4,125,697, Cl. 526-88.000.

Nott, Alan J.; and Price, William M., to Anglo-American Clays Corporation. Magnetic beneficiation of clays utilizing magnetic particulates. 4,125,460, Cl. 209-8.000.

Nouthuka, Hirofumi, to Hitachi, Ltd. Carburetor with fuel compensation device. 4,125,099, Cl. 123-119.00A.

Novello, Frederick C.: *See—*
Baldwin, John J.; and Novello, Frederick C., 4,125,530, Cl. 546-167.000.

Nudelman, Abraham: *See—*
Haviv, Fortuna; Nudelman, Abraham; and Patchornik, Abraham, 4,125,715, Cl. 544-27.000.

Nurnberg, Richard K., to Robertshaw Controls Company. Universal differential thermostat for solar heating system. 4,125,107, Cl. 126-270.000.

Nyfeler, Alex, to LGZ Landis & Gyr Zug AG. Relief pattern impressing apparatus. 4,125,760, Cl. 219-388.000.

Nyquist, Larry M. Clothing rod/shelf support unit. 4,125,078, Cl. 108-29.000.

Nyul, Paul: *See—*
O'Brien, James T.; Limm, Albert C.; Nyul, Paul; and Tassia, Vincent S., Jr., 4,125,777, Cl. 250-551.000.

O'Boyle, Leonard E.; and Torok, Gabor P., to Bell Telephone Laboratories, Incorporated. Graphics transmission system. 4,125,743, Cl. 178-18.000.

O'Brien, Edward F.; and Langdon, William K., to BASF Wyandotte Corporation. Fuels containing polyoxyalkylene ether demulsifiers. 4,125,382, Cl. 44-51.000.

O'Brien, James T.; Limm, Albert C.; Nyul, Paul; and Tassia, Vincent S., Jr., to RCA Corporation. Radiation emitter-detector package. 4,125,777, Cl. 250-551.000.

Occidental Oil Shale, Inc.: *See—*
Ridley, Richard D., 4,125,157, Cl. 166-259.000.

Ochiai, Takeshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Skid control system for vehicles. 4,125,296, Cl. 303-109.000.

Odell, Jack L.: *See—*
Bell, Duncan; Odell, Jack L.; Olson, David E.; and Peirce, Allen E., 4,124,990, Cl. 405-167.000.

Ogawa, Mashahiro: *See—*
Torii, Kyozo; Koshino, Kenji; Niimi, Yuji; Ogawa, Mashahiro; and Kamo, Keizo, 4,125,026, Cl. 74-713.000.

Ohashi, Michihiro: *See—*
Tanaka, Eizi; Ohashi, Michihiro; Mochizuki, Hiroshi; and Nishimatsu, Akira, 4,125,102, Cl. 123-139.0AW.

Ohashi, Tokuyoshi; Matuda, Akira; and Horii, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Safety equipment for gas burner. 4,125,356, Cl. 431-76.000.

Ohhinata, Ichiro; Okuhara, Shinzi; Kawanami, Mitsuru; and Tokunaga, Michio, to Hitachi, Ltd. Semiconductor switch circuit. 4,125,787, Cl. 307-252.00A.

Ohio State University Research Foundation: *See—*
Munk, Benedikt A., 4,125,841, Cl. 343-909.000.

Ohkubo, Kazuo: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,125,604, Cl. 424-177.000.
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,125,619, Cl. 424-267.000.

Ohls, Per-Erik; and Soininen, Mauri, to Oy, Valmet; and Ohls, Per-Erik, part interest to each. Method and apparatus for controlling the moisture content of a web of sheet material. 4,124,942, Cl. 34-115.000.

Ohnishi, Masahiro; Oono, Hiroshi; and Tozaki, Katutosi, to Fuji Photo Film Co., Ltd. Method for laser recording using zeroth order light and heat deformable medium. 4,125,842, Cl. 346-1.000.

O'Hogan, Jerome M.: *See—*
Hruby, John F.; McCleary, Rex; O'Hogan, Jerome M.; and Searle, Nathan H., 4,125,868, Cl. 364-900.000.

Ohta, Akira: *See—*
Watanabe, Jun; Ohta, Akira; and Kobayashi, Shigeo, 4,125,638, Cl. 429-199.000.

Ohta, Noriyuki: *See—*
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Osawa, Hisayou, 4,125,533, Cl. 546-19.000.

Ohya, Masaki: *See—*
Kaneko, Akira; Ohya, Masaki; Suzuki, Masayasu; and Kobayashi, Akio, 4,125,654, Cl. 428-64.000.

Oi, Masakazu: *See*—
Nagamatsu, Kazuo; Yasuhara, Tadao; Oi, Masakazu; and Maeda, Hideaki, 4,125,805, Cl. 324-54.000.
Oil States Rubber Co.: *See*—
Landers, Don B., 4,124,988, Cl. 405-228.000.
Oishi, Minoru; Hirakoso, Keiichiro; Iio, Katsuro; Nagai, Yasuhiro; and Nariai, Tetsurou, to Kobe Steel, Ltd. Vertical welding method. 4,125,758, Cl. 219-126.000.
Okada, Toshiyuki: *See*—
Kiyohara, Michiya; Okada, Toshiyuki; and Yamamoto, Hideyuki, 4,125,759, Cl. 219-137.0PS.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, to Mitsubishi Chemical Industries Limited; and Okamoto, Shosuke. N2-Arylsulfonyl-L-argininamides and the pharmaceutically acceptable salts thereof. 4,125,604, Cl. 424-177.000.
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, to Mitsubishi Chemical Industries, Ltd.; and Okamoto, Shosuke. N^2-naphthalenesulfonyl-L-arginine derivatives and the pharmaceutically acceptable acid addition salts thereof. 4,125,619, Cl. 424-267.000.
Oki Electric Industry Co., Ltd.: *See*—
Murata, Kazuo; and Kito, Terukazu, 4,125,897, Cl. 364-702.000.
Okuhara, Shinzi: *See*—
Ohhinata, Ichiro; Okuhara, Shinzi; Kawanami, Mitsuru; and Tokunaga, Michio, 4,125,787, Cl. 307-252.00A.
Okuyama, Toshiaki: *See*—
Nagase, Hiroshi; Okuyama, Toshiaki; Kubota, Yuzuru; and Suzuki, Katsunori, 4,125,796, Cl. 318-175.000.
Olcese, Luis A.; and Roesch, Joseph E., to Xerox Corporation. Cut and clinch mechanism. 4,125,136, Cl. 140-105.000.
Olin Corporation: *See*—
Dever, Gerald V., Jr.; and Chiocchio, Louis R., 4,125,138, Cl. 141-141.000.
Oliver Machinery Company: *See*—
Nelson, John W., 4,125,365, Cl. 432-152.000.
Olson, David E.: *See*—
Bell, Duncan; Odell, Jack L.; Olson, David E.; and Peirce, Allen E., 4,124,990, Cl. 405-167.000.
Olson, Leonard. Planetary blade turbine. 4,125,343, Cl. 416-17.000.
Olson, Paul E.; and Lyons, Michael D., to American Standard Inc. Multi-engine control system providing equalized torque for driving a common load. 4,124,980, Cl. 60-700.000.
Olstowski, Franciszek, to Dow Chemical Company, The. Non-cellular and cellular composites of polyurethanes and vinyl polymers. 4,125,487, Cl. 521-137.000.
Onoe, Yasumitsu: *See*—
Katoh, Hiroshi; Onoe, Yasumitsu; Kawamura, Koichi; and Akisue, Osamu, 4,125,416, Cl. 148-12.00F.
Onoue, Takuo. Folding knives. 4,124,939, Cl. 30-161.000.
Ooms, William J.: *See*—
Davis, James A.; and Ooms, William J., 4,125,855, Cl. 357-45.000.
Fulton, Alan W.; Ooms, William J.; and Reed, Ray A., 4,125,853, Cl. 357-36.000.
Oono, Hiroshi: *See*—
Ohnishi, Masahiro; Oono, Hiroshi; and Tozaki, Katutosi, 4,125,842, Cl. 346-1.000.
Opex Corporation: *See*—
Stevens, Albert F.; and Haley, Paul E., 4,124,968, Cl. 53-381.00R.
Optische Werke G. Rodenstock: *See*—
Rassow, Bernd; Wolf, Diethard; and Korner, Klaus, 4,125,320, Cl. 351-13.000.
Orient Watch Co., Ltd.: *See*—
Morozumi, Shinji, 4,124,975, Cl. 58-58.000.
Orlowski, Marian; and Wilk, Sherwin, to Mt. Sinai School of Medicine of the City University of New York. Synthesis and use of L-γ-glutamyl-DOPA. 4,125,626, Cl. 424-319.000.
Ormond, Alfred N. Load cells for flexure isolated electronic scale. 4,125,168, Cl. 177-211.000.
Oroshnik, William: *See*—
Close, Ralph E.; and Oroshnik, William, 4,125,735, Cl. 560-254.000.
Orth, Dieter: *See*—
Radunz, Hans-Eckart; Orth, Dieter; Baumgarth, Manfred; Lissner, Reinhard; and Maisenbacher, Jurgen, 4,125,622, Cl. 424-276.000.
Orthoefer, Frank T., to A. E. Staley Manufacturing Company. Pliable vegetable protein products. 4,125,630, Cl. 426-104.000.
Osaka Transformer Co., Ltd.: *See*—
Kiyohara, Michiya; Okada, Toshiyuki; and Yamamoto, Hideyuki, 4,125,759, Cl. 219-137.0PS.
Osamu, Uno: *See*—
Kamei, Mitsuru; Osamu, Uno; Toru, Ogawa; Yoichiro, Ishii; and Masahiro, Satomi, 4,125,021, Cl. 73-304.00R.
Osawa, Hisayou: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Osawa, Hisayou, 4,125,533, Cl. 546-19.00J.
Oshida, Yoshitada; and Sawano, Susumu, to Hitachi, Ltd. Videodisc play-back apparatus with variable width beam. 4,125,859, Cl. 358-128.000.
Otis Engineering Corporation: *See*—
Groves, David L., Sr.; Long, Olen R.; and McCoy, Billy G., 4,125,162, Cl. 166-314.000.
Otsubo, Kizuku; Murasaki, Akira; and Kita, Takehiko, to Nissan Motor Company, Limited. Ignition timing control system. 4,125,096, Cl. 123-117.00A.
Outboard Marine Corporation: *See*—
Hicks, John E.; and Stolley, Ronald M., 4,125,284, Cl. 296-62.000.
Outukumpu OY: *See*—
Leimala, Raimo J.; and Seilo, Matti, 4,125,587, Cl. 423-139.000.
Owens-Illinois, Inc.: *See*—
Boling, Norman L.; and Dube, George, 4,125,816, Cl. 331-94.50F.
Kupsky, George A.; and Santchi, Douglas L., 4,124,926, Cl. 29-25.130.
Thayer, Stephen C., 4,125,307, Cl. 316-19.000.
Oy, Valmet: *See*—
Ohls, Per-Erik; and Soininen, Mauri, 4,124,942, Cl. 34-115.000.
Oyamada, Takashi: *See*—
Kinoshita, Toshiharu; Shinoda, Yoshio; Oyamada, Takashi; Masuda, Mitsuo; and Arai, Noritomo, 4,125,749, Cl. 179-99.000.
Ozimec, Stephen. Apparatus for accomplishing solder bonding. 4,125,216, Cl. 228-4.500.
Pactra Industries, Inc.: *See*—
Howard, Jerald D., 4,125,499, Cl. 260-22.00T.
Pako Corporation: *See*—
Baert, Victor R., 4,125,326, Cl. 355-74.000.
Paletto, Raimondo, to SGS-ATES Componenti Elettronici S.p.A. Resin-encased microelectronic module. 4,125,740, Cl. 174-52.0PE.
Pallos, Ferenc M., to Stauffer Chemical Company. Formamidine insecticidal compounds. 4,125,627, Cl. 424-326.000.
Palmer, Bertram J.; and Steuer, Herbert K., to GKN Transmissions Limited. Variable speed transmission means. 4,125,037, Cl. 74-732.000.
Pape, Hermann; Schroeder, Peter; and Schmitz, Rudolf, to Gardisette Holding AG. Curtain or drapery hanging arrangement. 4,125,143, Cl. 160-348.000.
Papst Motoren KG: *See*—
Schmider, Fritz, 4,125,792, Cl. 310-268.000.
Pardee, Robert P., to Ball Brothers Research Corporation. Lubricants comprising dialkanolamine derivatives. 4,125,668, Cl. 428-409.000.
Parikh, Indu: *See*—
Cuatrecasas, Pedro; and Parikh, Indu, 4,125,492, Cl. 260-9.000.
Parrott, George A.; and Norris, John B., to Dresser Europe S.A. Breaking apparatus for use with a conveyor. 4,125,227, Cl. 241-186.00R.
Parshin, Alexei N.: *See*—
Komarov, Jury I.; Parshin, Alexei N.; and Titov, Dmitry V., 4,125,134, Cl. 139-436.000.
Parsons, John H., to Fisons Limited. Acaricidal pyridinium salts. 4,125,617, Cl. 424-263.000.
Patchornik, Abraham: *See*—
Haviv, Fortuna; Nudelman, Abraham; and Patchornik, Abraham, 4,125,715, Cl. 544-27.000.
Patel, Arvind M.: *See*—
Eige, John J.; Patel, Arvind M.; Roberts, Spencer D.; and Stedman, David, 4,125,881, Cl. 360-50.000.
Patelhold Patentverwertungs- & Elektro Holding AG: *See*—
Bagdasarjanz, Felix; and Guanella, Gustav, 4,125,817, Cl. 332-19.000.
Patil, Arvind S.; and Weissman, Eugene Yehuda, to BASF Wyandotte Corporation. Diaphragms from discrete thermoplastic fibers requiring no bonding or cementing. 4,125,451, Cl. 204-296.000.
Patterson, John A.: *See*—
Kolaian, Jack H.; McCoy, Frederic C.; and Patterson, John A., 4,125,475, Cl. 252-89.00R.
Patton, Harold Y. Planter kit and display package therefor. 4,124,953, Cl. 47-66.000.
Paulisch, Heinz. Seat for vehicles. 4,125,287, Cl. 297-344.000.
Pauls, Walter L.: *See*—
Klowak, Bernard G.; Pauls, Walter L.; and Vermillon, Frederick J., Jr., 4,125,659, Cl. 428-153.000.
Pavio, Anthony M., to Vari-L Company, Inc. Broadband high frequency baluns and mixer. 4,125,810, Cl. 325-446.000.
Pawlak, Tadeusz J.: *See*—
Lowther, Leslie; and Pawlak, Tadeusz J., 4,125,885, Cl. 361-114.000.
Peace, John, to British Steel Corporation. Magnetic separation of materials. 4,125,191, Cl. 209-609.000.
Pease, William M., to Raytheon Company. Display range marker processor. 4,125,834, Cl. 343-5.0EM.
Peirce, Allen E.: *See*—
Bell, Duncan; Odell, Jack L.; Olson, David E.; and Peirce, Allen E., 4,124,990, Cl. 405-167.000.
Penn, Silas. Bumper guard-luggage carrier. 4,125,214, Cl. 224-42.080.
Pennwalt Corporation: *See*—
Ciavattoni, Anthony; Ujvary, Josef; and Gardella, John M., 4,125,774, Cl. 250-439.00P.
Kamath, Vasanth R., 4,125,695, Cl. 526-73.000.
Kamath, Vasanth R., 4,125,696, Cl. 526-73.000.
Sandler, Stanley R., 4,125,733, Cl. 560-87.000.
Perfetti, Guido A.; and Darlington, Henry, to Bethlehem Steel Corporation. Thermosetting organic coated metallic sheet. 4,125,670, Cl. 428-626.000.
Peritz, Leigh A.; and Huber, Alan C. Easy-leveling support device. 4,125,302, Cl. 312-242.000.
Perkin-Elmer Corporation, The: *See*—
Venghiattis, Alexis A., 4,125,225, Cl. 239-338.000.
Perna, Frank: *See*—
Cashel, Aloysius T.; Perna, Frank; Trussell, Gerald C.; D'Souza, Alfred C.; Karlin, Richard A.; Caruth, James R.; Van Ermen, Gary L.; Arnston, Robert W.; Comiskey, Gary F.; Borgens, Frederick R.; Kreft, Keith A.; Damm, Arthur; Sienaski, Dennis

C.; Shepardson, Robert C.; Leung, Yam C.; and Jankowski, Thomas M., 4,125,894, Cl. 364-442.000.

Perren, Benno; and Schreiber, Herbert. Probe for determining organic liquids. 4,125,822, Cl. 338-34.000.

PerSci, Inc.: *See*—
Erickson, Robert W., Sr.; and Erickson, Robert W., Jr., 4,125,882, Cl. 360-78.000.

Peruffo, Alessandro; and De Barba, Renzo, to TEIMEX A.G. IMP-EXP Teilmetallbau. Machine for washing, selecting, cleaning and slicing the stems of mushrooms. 4,125,067, Cl. 99-639.000.

Pesson, Marcel E.; and Geiger, Suzanne W., to Laboratoire Roger Bellon. Process for the preparation of 4-chloro-5-alkoxycarbonyl-2-methoxy-pyrimidines. 4,125,720, Cl. 544-318.000.

Peter Ilmberger KG, Maschinen -und Zahnradfabrik: *See*—
Brandl, Josef, 4,125,639, Cl. 427-233.000.

Peters, James: *See*—
Mani, Inder; and Peters, James, 4,125,504, Cl. 260-29.70S.

Petersen, Louis P., to General Electric Company. Process for producing silylphosphates. 4,125,551, Cl. 260-448.20E.

Peterson, David C., to Upjohn Company, The. 12,13(E)-Didehydro-13,14-dihydro-9,10-didehydro-9-deoxy-PGD_2 compounds. 4,125,546, Cl. 260-408.000.

Peterson, David C., to Upjohn Company, The. 12,13(E)-Didehydro-13,14-dihydro-9-deoxy-PGD_1 compounds. 4,125,547, Cl. 260-408.000.

Peterson, David C., to Upjohn Company, The. 12,13(E)-Didehydro-13,14-dihydro-9,10-didehydro-9-deoxy-PGD_1 compounds. 4,125,548, Cl. 260-408.000.

Petit, George S.; and Wright, Ralph R., to United States of America, Energy. Method for conducting electroless metal-plating processes. 4,125,642, Cl. 427-8.000.

Pettelkau, Hans-Jurgen; Ehrig, Bodo; Nothen, Karl; and Rosahl, Dietrich, to Bayer Aktiengesellschaft. Process for the production of polychloroprene. 4,125,697, Cl. 526-88.000.

Peyton, John J., to Industrial Automation Corporation. Box opening apparatus. 4,124,969, Cl. 53-382.000.

Pfahler, Gerhard: *See*—
Haberlein, Harald; Mayer, Norbert; and Pfahler, Gerhard, 4,125,501, Cl. 260-23.00H.
Mayer, Norbert; Pfahler, Gerhard; and Scheidl, Franz, 4,125,500, Cl. 260-23.00H.

Pfieffer, David C.: *See*—
Salmonsen, Greg C.; and Pfieffer, David C., 4,125,084, Cl. 116-99.000.

Pfizer Inc.: *See*—
Sciavolino, Frank C., 4,125,705, Cl. 536-9.000.

Phelps, Richard W., to Black Clawson Company, The. Vertical twin wire paper machine. 4,125,428, Cl. 162-301.000.

Philipp, Emmett J., to Air Filter Corporation. Handle construction for filter frame. 4,125,386, Cl. 55-493.000.

Phillips, Bobby M.; and Manning, Charles E., to Eastman Kodak Company. Process for making slub yarn from continuous filament yarn. 4,124,924, Cl. 28-220.000.

Phillips, Clarence A. L.: *See*—
Downer, John D.; and Phillips, Clarence A. L., 4,125,400, Cl. 71-127.000.

Phillips Petroleum Company: *See*—
Campbell, Robert W., 4,125,525, Cl. 528-388.000.
Cobb, Raymond L., 4,125,536, Cl. 260-326.00C.
Glinsmann, Gibert R., 4,125,156, Cl. 166-252.000.
Henderson, Eulas W., 4,125,456, Cl. 209-140.000.
Holtz, Hans D., 4,125,383, Cl. 44-66.000.
Rogers, Ronald S., 4,125,381, Cl. 422-190.000.
Scoggins, Myles W., 4,125,373, Cl. 23-230.0HC.
Uraneck, Carl A.; and Burleigh, John E., 4,125,481, Cl. 252-431.00C.

Pickle, William H. Random wave hydraulic engine. 4,125,346, Cl. 417-332.000.

Picquendar, Jean-Edgar, to Thomson-CSF. Telephone switching circuit. 4,125,747, Cl. 179-15.0AT.

Pieper, Paul S. Low thermal expansion ceramic composition. 4,125,408, Cl. 106-62.000.

Pierce Chemical Company: *See*—
Gindler, E. Melvin, 4,125,377, Cl. 23-230.00B.

Pittinger, Charles B., Jr.: *See*—
Pittinger, Charles B., Sr.; and Pittinger, Charles B., Jr., 4,125,339, Cl. 403-348.000.

Pittinger, Charles B., Sr.; and Pittinger, Charles B., Jr. Releasably interlocked, assymmetrical, lugged flange joint with fixed relative orientation. 4,125,339, Cl. 403-348.000.

Plamquist, John M., to Western Electric Co., Inc. Laser welding. 4,125,755, Cl. 219-121.00L.

Plaskett, Lawrence G., to Biotechnical Processes Limited. Coagulation and flavoring of spun protein fibers. 4,125,634, Cl. 426-231.000.

Platzer, George E., Jr., to Chrysler Corporation. Solid state fluid flow sensor. 4,125,093, Cl. 123-32.0EA.

Pohl, Joachim, to Brown, Boveri & Cie AG. Electronic touch key. 4,125,794, Cl. 315-362.000.

Polaroid Corporation: *See*—
Bloom, Stanley M.; Chiklis, Charles K.; and Kinsman, Gordon F., 4,125,685, Cl. 429-122.000.
Kinsman, Gordon F., 4,125,686, Cl. 429-152.000.
Land, Edwin H., 4,125,684, Cl. 429-122.000.

Pollnow, Harold J., Jr., to Allen-Bradley Company. Demand/schedule controller. 4,125,782, Cl. 307-35.000.

Polonio, John D., to Bunker Ramo Corporation. Apparatus for baseline restoration in an AC-coupled signal. 4,125,812, Cl. 328-162.000.

Porter, Allan W. H., to Saurer, Adolph. Fixed driving connection between a guide roller and delivery roller of a loom. 4,125,131, Cl. 139-99.000.

Porter, Clifford; and Bakun, Paul. Panels for solar heating system. 4,125,108, Cl. 126-271.000.

Porter, David E., to PSW Associates. Electrically calibrated air gauging apparatus. 4,125,011, Cl. 73-4.00R.

Porter, Samuel, Jr.: *See*—
Chang, Wen-Hsuan; Porter, Samuel, Jr.; and Wismer, Marco, 4,125,570, Cl. 260-849.000.

Posiviata, Richard W.; and Johnston, Jonathan A., to Gates Rubber Company, The. Fibrated admix or polymer and process therefore. 4,125,493, Cl. 260-17.4Cl..

Post Office: *See*—
Jackson, Lynden A.; and Midwinter, John E., 4,125,768, Cl. 250-227.000.
Miles, John S., 4,125,658, Cl. 428-131.000.

Postma, Randall F. Concrete dock. 4,124,986, Cl. 405-212.000.

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Medovar, Boris I.; Latash, Yury V.; Bogachenko, Alexsey G.; Kaganovsky, Gary P.; Leibenzon, Semen A.; Eltsov, Konstantin S.; Gabuev, Georgy K.; and Poticha, Zinoviy I., 4,125,145, Cl. 164-252.000.

Poulain, Robert A. Structural improvements for stairs or stairs with variable geometry. 4,124,957, Cl. 52-183.000.

Pound, Thomas C.: *See*—
Jukes, John A.; Pound, Thomas C.; and Cascarano, Wayne A., 4,125,645, Cl. 427-117.000.

Powers, Dale R., to Corning Glass Works. Method of making optical waveguides. 4,125,388, Cl. 65-3.00A.

PPG Industries, Inc.: *See*—
Chang, Wen-Hsuan; Porter, Samuel, Jr.; and Wismer, Marco, 4,125,570, Cl. 260-849.000.
Gunter, Charles E., 4,125,387, Cl. 65-2.000.

Prasada, Birendra: *See*—
Mounts, Frank W.; Netravali, Arun N.; and Prasada, Birendra, 4,125,861, Cl. 358-133.000.

Precision Machine Products, Inc.: *See*—
Clingman, William H., Jr., 4,125,018, Cl. 73-190.0CV.
Clingman, William H., Jr., 4,125,123, Cl. 137-80.000.

Preload Company, Inc.: *See*—
Bush, Bill R.; and Hornstein, Jack, 4,124,960, Cl. 52-583.000.

Presto Lock Company, Division of Walter Kidde & Company, Inc.: *See*—
Bako, Lazlo, 4,125,282, Cl. 292-336.000.

Preus, Paul. Flotation means for barrier for water carried pollutants and method of making same. 4,124,981, Cl. 405-66.000.

Price, Ellie E., Jr. Laterally engageable and releasable nut assembly for threaded shafts. 4,125,049, Cl. 85-33.000.

Price, Frank C., Jr.: *See*—
Carver, George P.; Price, Frank C., Jr.; and Tyson, Thomas J., 4,125,223, Cl. 239-14.000.

Price, Raymond R.; and Elder, Michael A., to Rochester Silo, Inc. Torque arm assembly. 4,125,194, Cl. 214-17.0DB.

Price, William M.: *See*—
Nott, Alan J.; and Price, William M., 4,125,460, Cl. 209-8.000.

Prikryl, Jaroslav: *See*—
Liebenow, Walter; and Prikryl, Jaroslav, 4,125,721, Cl. 544-325.000.

Primo, Angelo M. Seaweed extract product and methods of producing and utilizing same. 4,125,392, Cl. 71-3.000.

Pro-Tech, Inc.: *See*—
McClure, Charles L., 4,125,020, Cl. 73-215.000.

Procter & Gamble Company, The: *See*—
Cracco, Francis J.; and Fanta, Wayne I., 4,125,624, Cl. 424-288.000.
Nicol, Charles H., 4,125,370, Cl. 8-137.500.

Proctor, Miles W.: *See*—
Barber, Thomas W.; and Proctor, Miles W., 4,125,579, Cl. 264-32.000.

Psaar, Hubertus, to Bayer Aktiengesellschaft. Process for the preparation of oxazine dyestuffs. 4,125,717, Cl. 544-102.000.

PSW Associates: *See*—
Porter, David E., 4,125,011, Cl. 73-4.00R.

Putnam, Cecil J., Jr.; and Malone, James E., to Putnam Pattern & Engineering Co. Self-aligning towing hitch. 4,125,272, Cl. 280-478.00B.

Putnam Pattern & Engineering Co.: *See*—
Putnam, Cecil J., Jr.; and Malone, James E., 4,125,272, Cl. 280-478.00B.

Putt, Bernard J.; and Hughet, Roger E. Storage cabinet for ski equipment. 4,125,300, Cl. 312-351.000.

Quaas, Joseph: *See*—
Wasserman, Rene; Quaas, Joseph; Chalard, Jean-Claude; Noel, Leon; and Steine, Hans-Theo, 4,125,754, Cl. 219-121.00P.

Quad Corporation: *See*—
deVries, Egbert, 4,125,589, Cl. 423-245.000.

Quisenberry, Tony M.: *See*—
Hudspeth, Emmett L.; Richardson, Philip C.; Neathery, John L., Jr.; Dykstra, Jerald P.; Boger, Allen D., Jr.; Sims, William B., Jr.; Hunt, Glenn E.; and Quisenberry, Tony M., 4,125,111, Cl. 128-2.05T.

Quy Phan, Chi, to Thomson-Brandt. Refrigerated unit. 4,125,301, Cl. 312-214.000.

Raber, Peter E.: *See*—
Gordon, Jason M.; and Raber, Peter E., 4,125,317, Cl. 356-376.000.

Rabinowitz, Mario, to Electric Power Research Institute, Inc. Tiered convoluted shielded insulators. 4,125,742, Cl. 174-211.000.

Racal-Vadic, Inc.: *See—*
Maxwell, Ronald K., 4,125,872, Cl. 364-900.000.
Rado, Theodore A.; and Morris, Alan J., to Kerr-McGee Chemical Corporation. Cyclone separator for high temperature operations with corrosive gases. 4,125,385, Cl. 55-269.000.
Radunz, Hans-Eckart; Orth, Dieter; Baumgarth, Manfred; Lissner, Reinhard; and Maisenbacher, Jurgen, to Merck Patent Gesellschaft mit beschrankter Haftung. 1,4-Oxathianes. 4,125,622, Cl. 424-276.000.
Raftis, Spiros G.: *See—*
Ezekoye, Levi I.; and Raftis, Spiros G., 4,125,125, Cl. 137-315.000.
Raginskaya, Ljudmila K.: *See—*
Ryabenko, Evgeny A.; Bljum, Grigory Z.; Naida, Tatyana B.; Golub, Alexandr E.; Galchina, Natalya I.; Aronov, Alexandr R.; Semenova, Natalya F.; Raginskaya, Ljudmila K.; and Vonsovsky, Alexandr M., 4,125,596, Cl. 423-522.000.
Ragoonanan, Dulcie: *See—*
Downer, John D.; and Ragoonanan, Dulcie, 4,125,395, Cl. 71-27.000.
Ramey, Chester E.; and Luzzi, John J., to Ciba-Geigy Corporation. Substituted piperazine diones and polymeric compositions stabilized thereby. 4,125,517, Cl. 260-45.80N.
Ramirez Fernandez, Jose A.: *See—*
Molteni, Luigi; Ramirez Fernandez, Jose A.; Scrollini, Franco; and Vercesi, Giampiero, 4,125,616, Cl. 424-263.000.
Randall, Virginia G.: *See—*
Masri, Merle S.; and Randall, Virginia G., 4,125,708, Cl. 536-20.000.
Ranger Tool Company, Inc.: *See—*
Klyce, Thomas A., 4,124,919, Cl. 17-1.00F.
Rao, Ganta V.; and Shoup, Floyd K., to Far-Mar-Co, Inc. Method for fractionating the whole wheat kernel by centrifugal means. 4,125,528, Cl. 260-112.00G.
Raschepkin, Konstantin E.: *See—*
Buzhinsky, Vladimir L.; Raschepkin, Konstantin E.; Dunjushkin, Mikhail G.; Lysogorsky, Gennady T.; Valeev, Rustem I.; Nisenbaum, Yakov A.; and Ikhsanov, Deviz F., 4,124,914, Cl. 15-93.00R.
Raschka, Walter: *See—*
Kunze, Dietmar; and Raschka, Walter, 4,125,595, Cl. 423-500.000.
Rasmussen, Fred M.; and Dour, John S. Ultrasonic vehicle alarm system. 4,125,826, Cl. 340-63.000.
Rasmussen, Ole-Bendt. Multi-layer products. 4,125,581, Cl. 264-49.000.
Rassow, Bernd; Wolf, Diethard; and Korner, Klaus, to Optische Werke G. Rodenstock. Retinometer. 4,125,320, Cl. 351-13.000.
Rathburn, Lloyd C., to Loomis International, Inc. Well packer including anti-extrusion washer. 4,125,267, Cl. 277-188.00A.
Ratledge, R. Houston, Jr.: *See—*
Liberman, Harvey W.; Goranson, Paul L.; Ratledge, R. Houston, Jr.; and Salyers, John C., 4,125,196, Cl. 214-152.000.
Raven Industries, Inc.: *See—*
Winker, James A.; and Tekrony, Kenneth L., 4,125,233, Cl. 244-33.000.
Ravey, Donald L. Sequence switching circuit with latching alarm. 4,125,833, Cl. 340-542.000.
Ray-Chaudhuri, Dilip K.: *See—*
Schoenberg, Jules E.; and Ray-Chaudhuri, Dilip K., 4,125,494, Cl. 260-17.00A.
Raybestos-Manhattan, Inc.: *See—*
McGinnis, Stephen B., 4,125,496, Cl. 260-17.4BB.
Raymond International Inc.: *See—*
Fuller, Francis M., 4,124,982, Cl. 405-232.000.
Raymond, Jean-Francois, to Vango (Scotland) Limited, a part interest. Foldable dinghies. 4,124,910, Cl. 9-2.00C.
Raymond Lee Organization, Inc.: *See—*
Millard, Martha F.; and Gorges, Richard A., 4,124,906, Cl. 4-172.000.
Weir, Dean H., 4,125,256, Cl. 272-66.000.
Raytheon Company: *See—*
Brown, Clayton D., 4,125,751, Cl. 219-10.55B.
Hays, Herbert G.; and Sweitzer, Ralph W., 4,125,151, Cl. 165-58.000.
Pease, William M., 4,125,834, Cl. 343-5.0EM.
Razulis, Marie K., to United States of America, Army. Method for detecting water pollutants. 4,125,376, Cl. 23-230.00R.
RCA Corporation: *See—*
Coble, John T., 4,125,306, Cl. 316-1.000.
Kirschner, Barry A., 4,125,815, Cl. 331-8.000.
O'Brien, James T.; Limm, Albert C.; Nyul, Paul; and Tassia, Vincent S., Jr., 4,125,777, Cl. 250-551.000.
Reardon, Jeanne A., administratrix: *See—*
Reardon, Patrick A., II, deceased; and Reardon, Jeanne A., administratrix, 4,125,310, Cl. 339-92.00M.
Reardon, Patrick A., II, deceased; and by Reardon, Jeanne A., administratrix. Electrical connector assembly utilizing wafers for connecting electrical cables. 4,125,310, Cl. 339-92.00M.
Recker, Florian B. Automatic lock open coupler. 4,125,337, Cl. 403-11.000.
Recognition Equipment Incorporated: *See—*
Stovall, Milton A.; and Swartz, Richard L., 4,125,255, Cl. 271-251.000.
Redecker, Klaus; and Richtzenhain, Hermann, to Dynamit Nobel Aktiengesellschaft. Process for production of terephthalic dialdehyde. 4,125,561, Cl. 260-599.000.
Redel, Ray H. Convertible chair. 4,125,286, Cl. 297-325.000.
Reder-James, Brenda J.; and Ginter, Sally P., to Dow Chemical Company, The. Permanent topical textile antistats. 4,125,369, Cl. 8-115.600.
Redick, Daniel J. Self-closing gate. 4,124,954, Cl. 49-236.000.
Redl, George, to Bristol-Myers Company. Antibacterial compositions. 4,125,610, Cl. 424-211.000.
Redpath Dorman Long (North Sea) Limited: *See—*
Watson, Donald M.; and Nastasic, Vladimir, 4,124,989, Cl. 405-225.000.
Reed, Ray A.: *See—*
Fulton, Alan W.; Ooms, William J.; and Reed, Ray A., 4,125,853, Cl. 357-36.000.
Reinecke, Erich; and Ulrich, Helmut, to WABCO Westinghouse GmbH. Vehicle load-controlled brake pressure regulating valve device. 4,125,290, Cl. 303-22.00R.
Reineke, Charles E., to Dow Chemical Company, The. Trifluoromethanesulfonates. 4,125,555, Cl. 260-456.00F.
Reinert, John R., to Motorola, Inc. Dual port random access memory storage cell. 4,125,877, Cl. 365-190.000.
Reinhardt, Walter: *See—*
Atasoy, Kaya; Weckwarth, Karl F.; and Reinhardt, Walter, 4,125,602, Cl. 424-80.000.
Reinke, Theodore S.: *See—*
Wenstrom, Richard T.; Reinke, Theodore S.; Tolley, Calvert B.; and Brooks, J. Clayton, 4,124,920, Cl. 17-48.000.
Reinschutz, Hans. Paving block. 4,125,341, Cl. 404-41.000.
Reiss, Theodore. Record positioning device. 4,125,264, Cl. 274-1.00R.
Reissl, Manfred: *See—*
Abels, Theodor; Reissl, Manfred; and Muller, Willi, 4,125,199, Cl. 214-730.000.
Renkes, Karl-Heinz: *See—*
Josten, Friedrich; Cherubim, Martin; and Renkes, Karl-Heinz, 4,125,497, Cl. 260-18.00R.
Repa Feinstanzwerk GmbH: *See—*
Fohl, Artur, 4,125,142, Cl. 160-291.000.
Repke, Virginia L., to Johnson & Johnson. Disposable nursing pad. 4,125,114, Cl. 128-280.000.
Resnick, Jerome B.; and Combs, John W., to Med-El Inc. Method and apparatus for automated classification and analysis of cells. 4,125,828, Cl. 340-146.3CA.
Reuschel, Konrad; Dietze, Wolfgang; and Rucha, Ulrich, to Siemens Aktiengesellschaft. Process for depositing elemental silicon semiconductor material from a gas phase. 4,125,643, Cl. 427-9.000.
Reusser, Peter U. Apparatus for treating pipes. 4,125,089, Cl. 118-408.000.
Reuting, Hans W., to Elmeg Elektro-Mechnik GmbH. Socket and relay assembly. 4,125,887, Cl. 361-331.000.
Richardson, Philip C.: *See—*
Hudspeth, Emmett L.; Richardson, Philip C.; Neathery, John L., Jr.; Dykstra, Jerald P.; Boger, Allen D., Jr.; Sims, William B., Jr.; Hunt, Glenn E.; and Quisenberry, Tony M., 4,125,111, Cl. 128-2.05T.
Richter, Juergen H.: *See—*
Hitney, Herbert V.; Richter, Juergen H.; and Schefer, Murray H., 4,125,893, Cl. 364-300.000.
Richtzenhain, Hermann: *See—*
Redecker, Klaus; and Richtzenhain, Hermann, 4,125,561, Cl. 260-599.000.
Ridgell, James J., Jr.: *See—*
DeHart, David A.; and Ridgell, James J., Jr., 4,125,898, Cl. 364-718.000.
Ridley, Richard D., to Occidental Oil Shale, Inc. Removing sulfur dioxide from gas streams with retorted oil shale. 4,125,157, Cl. 166-259.000.
Riebel, Hans-Jochem: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, 4,125,609, Cl. 424-200.000.
Riedl, Franz. Regulable appliance for infinitely adjustable variator, especially for vehicles. 4,125,033, Cl. 74-125.500.
Rineisky, Anatoly A.: *See—*
Iljunin, Vladimir G.; Murogov, Viktor M.; Troyanov, Mikhail F.; Rineisky, Anatoly A.; and Shmelev, Anatoly N., 4,125,433, Cl. 176-68.000.
Ritter, Gerhard: *See—*
Ritter, Klaus; Jahrbacher, Gerhard; and Ritter, Gerhard, 4,125,753, Cl. 219-56.000.
Ritter, Klaus; Jahrbacher, Gerhard; and Ritter, Gerhard, to EVG Entwicklungs-u. Verwertungs-GmbH. Welding machine for lattice gratings. 4,125,753, Cl. 219-56.000.
RO-WI Rosenberg & Wilboltt I/S: *See—*
Wiboltt, Alfred E. J. J.; and Rosenberg, Jorgen, 4,125,271, Cl. 280-461.00A.
Robert Bosch GmbH: *See—*
Assenheimer, Jurgen; and Brettschneider, Johannes, 4,125,100, Cl. 123-124.00R.
Roberts, Peter C. T.: *See—*
Haken, Roger A.; Roberts, Peter C. T.; Taylor, Robert G.; and Traynar, Christopher P., 4,125,818, Cl. 333-70.00T.
Roberts, Richard W., to Borg-Warner Corporation. Disconnect mechanism for compressor drive. 4,125,180, Cl. 192-82.00T.
Roberts, Spencer D.: *See—*
Eige, John J.; Patel, Arvind M.; Roberts, Spencer D.; and Stedman, David, 4,125,881, Cl. 360-50.000.
Robertshaw Controls Company: *See—*
Nurnberg, Richard K., 4,125,107, Cl. 126-270.000.
Robinson, Tibor: *See—*
Komminoth, Paul; Robinson, Tibor; and Urosevic, Milica, 4,125,652, Cl. 427-390.00C.

Rochester Silo, Inc.: *See—*
Price, Raymond R.; and Elder, Michael A., 4,125,194, Cl. 214-17.0DB.

Rockwell International Corporation: *See—*
Bain, Lawrence J., 4,125,073, Cl. 101-216.000.

Rodgers, John L.; and Schofield, David, to National Research Development Corporation. Double ended stack computer store. 4,125,879, Cl. 365-236.000.

Roesch, Joseph E.: *See—*
Olcese, Luis A.; and Roesch, Joseph E., 4,125,136, Cl. 140-105.000.

Rogers, Olbert W. Artificial teeth construction. 4,125,442, Cl. 204-38.00C.

Rogers, Ronald S., to Phillips Petroleum Company. Oxidative dehydrogenation system. 4,125,381, Cl. 422-190.000.

Rogove, Arthur H.; and Hijuelos, Augusto H., to Allied Tube & Conduit Corporation. Prequench cooling for galvanized tubing. 4,124,932, Cl. 29-527.400.

Rohm and Haas Company: *See—*
Latty, James, 4,125,462, Cl. 210-23.00F.
Schoenenberger, Karl A.; and Fries, William, 4,125,550, Cl. 260-428.000.

Rollei Werke Franke & Heidecke: *See—*
Holtje, Wilfried, 4,125,766, Cl. 250-214.0SF.

Roller, Paul S. Cell and electrodes for electrolytic production of insoluble metal hydroxide. 4,125,448, Cl. 204-268.000.

Rolls-Royce Limited: *See—*
Smart, Anthony E., 4,125,778, Cl. 250-574.000.

Rolph, Donald L., to Memorex Corporation. Apparatus for centering and clamping a flexible magnetic recording disc. 4,125,883, Cl. 360-99.000.

Ronning, Bengt L. Apparatus for cleaning and painting gas bottles. 4,125,087, Cl. 118-72.000.

Rosahl, Dietrich: *See—*
Pettelkau, Hans-Jurgen; Ehrig, Bodo; Nothen, Karl; and Rosahl, Dietrich, 4,125,697, Cl. 526-88.000.

Rose, John B.: *See—*
Darragh, John I.; and Rose, John B., 4,125,562, Cl. 260-607.0AR.

Rose, William H.: *See—*
Grantiz, Richard F.; and Rose, William H., 4,125,309, Cl. 339-18.00P.

Rosenbaum, Larry A., to HPM Corporation. Process employing coextrusion feedblock. 4,125,585, Cl. 264-173.000.

Rosenberg, Jorgen: *See—*
Wiboltt, Alfred E. J. J.; and Rosenberg, Jorgen, 4,125,271, Cl. 280-461.00A.

Rosendall, Henry J., to Bissell, Inc. Floor sweeper with unitary frame. 4,124,913, Cl. 15-42.000.

Ross, William A., to Torrington Company, The. Apparatus and method for laser cutting. 4,125,757, Cl. 219-121.00L.

Rossi, Jean E., to Firmenich SA. Process for improving growth rate of piglets during weaning. 4,125,629, Cl. 426-2.000.

Roth, Martin, to Ciba-Geigy Corporation. N-Phenyl-maleic acid amides for regulating the growth and development of plants. 4,125,398, Cl. 71-115.000.

Roth, Michael; and Gluck, Herbert, to Wacker-Chemie GmbH. Process and composition for rendering surfaces hydrophobic and oleophobic. 4,125,673, Cl. 428-447.000.

Rothmayer, Karl-Heinz. Separable or foldable ski. 4,125,273, Cl. 280-603.000.

Rotocrop International, Limited: *See—*
Wilson, Clifford A., 4,125,394, Cl. 71-9.000.

Roudebush, Robert D., Jr. Automatically cancelling turn signal. 4,125,827, Cl. 340-73.000.

Roux, Jean. Extractor for watch push buttons. 4,124,929, Cl. 29-268.000.

Rozzi, Mario, to Detroit Radiant Products Company. Safety control system for gas-fired infrared radiant heater. 4,125,355, Cl. 431-71.000.

Rubey, Ulyss R. Device for showing receipt of predetermined shock. 4,125,085, Cl. 116-114.0AH.

Rubinstein, Charles B.: *See—*
Netravali, Arun N.; and Rubinstein, Charles B., 4,125,856, Cl. 358-13.000.

Rucha, Ulrich: *See—*
Reuschel, Konrad; Dietze, Wolfgang; and Rucha, Ulrich, 4,125,643, Cl. 427-9.000.

Rudner, Bernard, to Tenneco Chemicals, Inc. Smoking compositions. 4,125,118, Cl. 131-9.000.

Ruel, Jacques: *See—*
Schapira, Joseph; Ruel, Jacques; and Bleriot, Alain, 4,125,575, Cl. 260-923.000.

Rufuss Establishment: *See—*
Chiche, Rene, 4,124,958, Cl. 52-285.000.

Ruhnau, Gerhard; and Gudat, Wolfgang, to WABCO Westinghouse GmbH. Digital speed detecting circuit for a rotating member having a wide speed range. 4,125,295, Cl. 303-95.000.

Rust, Willard J.; and Rust, Willard M. Scaffold device. 4,125,173, Cl. 182-63.000.

Rust, Willard M.: *See—*
Rust, Willard J.; and Rust, Willard M., 4,125,173, Cl. 182-63.000.

Ryaa, Jan: *See—*
Bach, Erik; and Ryaa, Jan, 4,124,949, Cl. 46-23.000.

Ryabenko, Evgeny A.; Bljum, Grigory Z.; Naida, Tatyana B.; Golub, Alexandr E.; Galchina, Natalya I.; Aronov, Alexandr R.; Semenova, Natalya F.; Raginskaya, Ljudmila K.; and Vonsovsky, Alexandr M. Method of producing sulphuric acid. 4,125,596, Cl. 423-522.000.

S/V Tool Company, Inc.: *See—*
Schlicher, Charles W., 4,124,915, Cl. 15-105.000.

Sadjina, Heinz; and Veranneman, Georg, to Linde AG. Apparatus for the cooling and embrittlement of tires. 4,124,997, Cl. 62-320.000.

Saeedy, Mohammad R. M. Babies bed. 4,124,909, Cl. 5-99.00B.

Saeki, Yukio: *See—*
Nakamura, Nobutaka; and Saeki, Yukio, 4,125,502, Cl. 260-29.300.

Saft-Societe des Accumulateurs Fixes et de Traction: *See—*
Bonnaterre, Raymond, 4,125,688, Cl. 429-206.000.
Godard, Pierre, 4,125,802, Cl. 320-35.000.
Jumel, Yves, 4,125,689, Cl. 429-206.000.

Sagan, Johann: *See—*
Bretschneider, Hermann; Hueber, Herman P.; Louzil, Friedrich; Fischer, Karl; Jager, Lothar; and Sagan, Johann, 4,125,844, Cl. 346-74.100.

Saito, Masato: *See—*
Tsuchihashi, Michihiro; Saito, Masato; Yamanoshita, Makoto; Katsura, Hidetoshi; Myodo, Osamu; and Maeyama, Koichiro, 4,125,888, Cl. 362-231.000.

Saito, Nobuo, to Hitachi, Ltd. Fault tolerant shift register type memory device. 4,125,875, Cl. 365-1.000.

Saka, Masanori: *See—*
Arai, Yoshiyasu; Anahara, Meiji; Saka, Masanori; Kokubu, Tokio; and Takeuchi, Kunio, 4,124,972, Cl. 57-328.000.

Sakurada, Nobuaki: *See—*
Shinoda, Nobuhiko; Sakurada, Nobuaki; Ito, Tadashi; Yamamichi, Masayoshi; Murakami, Hiroyasu; and Suzuki, Masayuki, 4,125,832, Cl. 340-347.0DD.

Sakurai, Yoshitoshi, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust port liner support system. 4,124,977, Cl. 60-282.000.

Salmonsen, Greg C.; and Pfieffer, David C., to Muckle Manufacturing Division Builders Iron Products, Inc. Fire extinguisher alarm. 4,125,084, Cl. 116-99.000.

Salyers, John C.: *See—*
Liberman, Harvey W.; Goranson, Paul L.; Ratledge, R. Houston, Jr.; and Salyers, John C., 4,125,196, Cl. 214-152.000.

Samour, Carlos M.; and Vida, Julius A., to Bristol-Myers Company. Antiosteoporotic agents. 4,125,621, Cl. 424-275.000.

Sanders, David E.: *See—*
Chambers, Ramon P.; Gordy, Robert S.; Sanders, David E.; and Morrison, Cameron E., 4,125,764, Cl. 235-302.000.

Sandler, Stanley R., to Pennwalt Corporation. 2,3-Dibromopropyl polyoxyethylene trimellitate. 4,125,733, Cl. 560-87.000.

Sandoz Ltd.: *See—*
Komminoth, Paul; Robinson, Tibor; and Urosevic, Milica, 4,125,652, Cl. 427-390.00C.

Sanford, Charles L.: *See—*
Hergert, Richard E.; and Sanford, Charles L., 4,125,429, Cl. 162-123.000.

Sankey, Bruce M.: *See—*
Bushnell, James D.; Glivicky, Alexandr P.; Leighton, Milton D.; and Sankey, Bruce M., 4,125,458, Cl. 208-309.000.

Sankyo Co. Ltd.: *See—*
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Osawa, Hisayou, 4,125,533, Cl. 546-19.000.

Santchi, Douglas L.: *See—*
Kupsky, George A.; and Santchi, Douglas L., 4,124,926, Cl. 29-25.130.

SAPCO Systemanalyse und Projektberatung GmbH: *See—*
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Sarson, Alan E.; and Clark, William J. R., to Elliott Brothers (London) Limited. Field sequential color television camera arrangements. 4,125,857, Cl. 358-42.000.

Sasadi, John, to EDC Inc. Dry rock loading spout system. 4,125,195, Cl. 214-41.00R.

Sasazawa, Koji: *See—*
Dezawa, Shin-Ichiro; Sasazawa, Koji; Kitamoto, Tatsuji; and Yamazaki, Nobuo, 4,125,474, Cl. 252-62.620.

Sato, Kuniaki, to Kajima Corporation. Method of connecting hollow steel column to a hollow steel base member. 4,125,217, Cl. 228-169.000.

Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Feed mechanism for portable labeling machine. 4,125,074, Cl. 101-288.000.

Sato, Yoshio. Method for manufacturing a base of a pressure mount type semiconductor device. 4,124,935, Cl. 29-630.00R.

Saucier, Steven D.: *See—*
Theriot, Walter A.; Saucier, Steven D.; and Drinkard, B. M., 4,125,568, Cl. 260-681.500.

Sauerbier, Heinz: *See—*
Franke, Johannes; Kessler, Kurt; Kuhne, Ulrich; Sauerbier, Heinz; Schneider, Kurt; and Unbehaun, Karl, 4,125,154, Cl. 165-169.000.

Sauger, Guy G., to Cii Honeywell Bull (Compagnie Internationale pour L'informatique). Arrangement for protecting data stored in a digital computer. 4,125,891, Cl. 364-200.000.

Saunders, Graham J., to Huwood Limited. Mine roof supports. 4,124,984, Cl. 405-293.000.

Saurer, Adolph: *See—*
Porter, Allan W. H., 4,125,131, Cl. 139-99.000.

Savins, Joseph G.: *See—*
Waite, Jerry M.; Burdyn, Ralph F.; and Savins, Joseph G., 4,125,158, Cl. 166-273.000.

Sawano, Susumu: *See—*
Oshida, Yoshitada; and Sawano, Susumu, 4,125,859, Cl. 358-128.000.

Saxon, Arthur F., to Dravo Corporation. Apparatus for solvent extraction. 4,125,379, Cl. 422-269.000.
Schapira, Joseph; Ruel, Jacques; and Bleriot, Alain, to Compagnie Francaise de Produits Industriels. Phosphonylated amides. 4,125,575, Cl. 260-923.000.
Scharrenbroich, Helmut: *See*—
Fischer, Stefan; and Scharrenbroich, Helmut, 4,125,583, Cl. 264-98.000.
Schefer, Murray H.: *See*—
Hitney, Herbert V.; Richter, Juergen H.; and Schefer, Murray H., 4,125,893, Cl. 364-300.000.
Scheidl, Franz: *See*—
Mayer, Norbert; Pfahler, Gerhard; and Scheidl, Franz, 4,125,500, Cl. 260-23.00H.
Scheidler, Herwig: *See*—
Kristen, Klaus; and Scheidler, Herwig, 4,125,357, Cl. 431-78.000.
Scheifley, John C.; Shields, Clark R.; and Busby, David E., to Dow Chemical Company, The. Combustion of halogenated hydrocarbons. 4,125,593, Cl. 423-481.000.
Schenke, Larry A.: *See*—
Lewis, David L.; Schenke, Larry A.; Suchanski, Mary R.; and Franks, C. Richard, deceased, 4,125,449, Cl. 204-290.00F.
Schering Corporation: *See*—
Sherlock, Margaret H., 4,125,612, Cl. 424-250.000.
Schild, Felix, to Electrical Instrumentation Co. Ltd. Photometric apparatus. 4,125,330, Cl. 356-416.000.
Schilling, Franz, to Siempelkamp Giesserei GmbH & Co. Pressure vessel, especially for a nuclear reactor core. 4,125,202, Cl. 220-3.000.
Schilling, William A., to EMC Technology, Inc. Transitional RF connector. 4,125,308, Cl. 339-17.0LC.
Schirripa, Thomas J.: *See*—
Bemmels, Cyrus W.; Mumber, Richard A.; and Schirripa, Thomas J., 4,125,665, Cl. 428-352.000.
Schlicher, Charles W., to S/V Tool Company, Inc. Combination scraper and squeegee. 4,124,915, Cl. 15-105.000.
Schlumberger Technology Corporation: *See*—
Nicolas, Yves; and Tromelin, Jacques, 4,125,013, Cl. 73-151.000.
Schluter, Siegfried H.: *See*—
Kritzler, Gerhard; Schluter, Siegfried H.; and Eckert, Paul, 4,125,149, Cl. 165-10.000.
Schmednecht, Fred C., to Slurry Systems, Inc. Method and apparatus for mixing liner material for moisture retention basins. 4,125,332, Cl. 366-33.000.
Schmider, Fritz, to Papst Motoren KG. Brushless D-C motor. 4,125,792, Cl. 310-268.000.
Schmidt, Gary M.: *See*—
Sipp, Steven O.; Schmidt, Gary M.; and Venaleck, John T., 4,125,313, Cl. 339-176.00M.
Schmidt, Helmut: *See*—
Bader, Christian; and Schmidt, Helmut, 4,125,797, Cl. 318-270.000.
Schmitz, Rudolf: *See*—
Pape, Hermann; Schroeder, Peter; and Schmitz, Rudolf, 4,125,143, Cl. 160-348.000.
Schmoyer, Laurence F., to Kerr-McGee Chemical Corporation. Method for manufacturing boron trichloride. 4,125,590, Cl. 423-292.000.
Schmunck, Karlheinz: *See*—
Herbener, Klaus; and Schmunck, Karlheinz, 4,125,250, Cl. 266-50.000.
Schnabel Foundation Company: *See*—
Weatherby, David E., 4,124,983, Cl. 405-260.000.
Schneider, Alfred: *See*—
Kohl, Wilhelm; Eibner, Robert; Nolle, Hans-Heinrich; Schneider, Alfred; and Moldovany, Nikolaus-Johann, 4,125,393, Cl. 71-3.000.
Schneider, Harald: *See*—
Marten, Rainer; and Schneider, Harald, 4,125,769, Cl. 250-272.000.
Schneider, Kurt: *See*—
Franke, Johannes; Kessler, Kurt; Kuhne, Ulrich; Sauerbier, Heinz; Schneider, Kurt; and Unbehaun, Karl, 4,125,154, Cl. 165-169.000.
Schoenberg, Jules E.; and Ray-Chaudhuri, Dilip K., to National Starch and Chemical Corporation. Adhesion promoter for 2-cyanoacrylate adhesive compositions. 4,125,494, Cl. 260-17.00A.
Schoenenberger, Karl A.; and Fries, William, to Rohm and Haas Company. Removal of free fatty acids from water immiscible fluids via ion exchange resins. 4,125,550, Cl. 260-428.000.
Schofield, David: *See*—
Rodgers, John L.; and Schofield, David, 4,125,879, Cl. 365-236.000.
Scholl, Inc.: *See*—
Tomlin, Benjamin B. A., 4,124,946, Cl. 36-43.000.
Scholz, Herbert; and Gotsmann, Guenther, to BASF Aktiengesellschaft. Manufacture of alkali metal salts of arabonic acid. 4,125,559, Cl. 562-531.000.
Schon, Franz: *See*—
Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 4,124,941, Cl. 34-18.000.
Schonherr, Wolf-Dieter; Wolfert, Karl-Heinz; and Lachmann, Veit, to Goetzewerke Friedrich Goetze AG. Lip sealing ring and method for its manufacture. 4,125,266, Cl. 277-153.000.
Schreiber, Herbert: *See*—
Perren, Benno; and Schreiber, Herbert, 4,125,822, Cl. 338-34.000.
Schroeder, Diether. Mobile radar method for sensing inclusions in subsoil. 4,125,804, Cl. 324-6.000.
Schroeder, Peter: *See*—
Pape, Hermann; Schroeder, Peter; and Schmitz, Rudolf, 4,125,143, Cl. 160-348.000.
Schubart, Rudiger; and Albrecht, Klaus-Dieter, to Bayer Aktiengesellschaft. Process for the production of a storable, scorch-resistant rubber/fabric bonding agent combination. 4,125,512, Cl. 260-42.140.
Schuldies, John J.: *See*—
Ezis, Andre; and Schuldies, John J., 4,125,592, Cl. 423-344.000.
Schwan, Thomas J.; and Goldenberg, Marvin M., to Morton-Norwich Products, Inc. 4-Acetoxy-1,2,3,4-tetrahydro-2,2-dimethyl-6,7-methylenedioxyisoquinolinium iodide. 4,125,529, Cl. 546-90.000.
Schwartzman, Irwin J.; and Wilgermein, Paul K., to J. Schwartzman Manufacturing & Supply Co. Self-drilling screw. 4,125,050, Cl. 85-41.000.
Sciavolino, Frank C., to Pfizer Inc. Semi-synthetic 4-amino-oleandomycin derivatives. 4,125,705, Cl. 536-9.000.
Scibor-Rylski, Marek T., to Xerox Corporation. TIR modulator. 4,125,318, Cl. 350-356.000.
SCM Corporation: *See*—
Close, Ralph E.; and Oroshnik, William, 4,125,735, Cl. 560-254.000.
Scoggins, Myles W., to Phillips Petroleum Company. Measurement of trace ethylene glycol in oil. 4,125,373, Cl. 23-230.0HC.
Scott, Daniel G., to Westinghouse Air Brake Company. Lockable hose coupling. 4,125,279, Cl. 285-69.000.
Scott Paper Company: *See*—
Grossman, Stephen R., 4,125,430, Cl. 162-207.000.
Scott, Steven W.; and Wambach, Allen D., to General Electric Company. Thermoplastic molding composition. 4,125,571, Cl. 260-860.000.
Scott, Steven W., to General Electric Company. Thermoplastic molding composition. 4,125,572, Cl. 260-860.000.
Scrollini, Franco: *See*—
Molteni, Luigi; Ramirez Fernandez, Jose A.; Scrollini, Franco; and Vercesi, Giampiero, 4,125,616, Cl. 424-263.000.
Sea Savory, Inc.: *See*—
Wenstrom, Richard T.; Reinke, Theodore S.; Tolley, Calvert B.; and Brooks, J. Clayton, 4,124,920, Cl. 17-48.000.
Sear, Derek W., to Setech International Limited. Reclaimed vulcanized rubber. 4,125,578, Cl. 264-29.500.
Searle, Nathan H.: *See*—
Hruby, John F.; McCleary, Rex; O'Hogan, Jerome M.; and Searle, Nathan H., 4,125,868, Cl. 364-900.000.
Sefton, Philip C. Touch switches. 4,125,783, Cl. 307-116.000.
Seidl, Ludwig J. Top rail tie bracket for concrete forms. 4,125,245, Cl. 249-33.000.
Seilo, Matti: *See*—
Leimala, Raimo J.; and Seilo, Matti, 4,125,587, Cl. 423-139.000.
Sekiguchi, Sadao; Matsumoto, Kojiro; Ishikawa, Tetsuo; Mishiba, Saburo; and Izaki, Nobujiro, to Sumitomo Naugatuck Co., Ltd. Color developing sheet with organic developer and latex binder. 4,125,675, Cl. 428-483.000.
Selas Corporation of America: *See*—
Lempa, Roman F., 4,125,359, Cl. 431-175.000.
Semenova, Natalya F.: *See*—
Ryabenko, Evgeny A.; Bljum, Grigory Z.; Naida, Tatyana B.; Golub, Alexandr E.; Galchina, Natalya I.; Aronov, Alexandr R.; Semenova, Natalya F.; Raginskaya, Ljudmila K.; and Vonsovsky, Alexandr M., 4,125,596, Cl. 423-522.000.
Seragnoli, Enzo, to G. D. Societa per Azioni. Switching device for switching a cigarette flow. 4,125,184, Cl. 198-442.000.
Seres, Robert J.; and Summers, James J., to Mine Safety Appliances Company. Mounting assembly connecting a face shield to a safety hat. 4,124,902, Cl. 2-10.000.
Setech International Limited: *See*—
Sear, Derek W., 4,125,578, Cl. 264-29.500.
Seward, Thomas P., III: *See*—
Araujo, Roger J.; Borrelli, Nicholas F.; Chodak, Jan B.; Hares, George B.; Meiling, Gerald S.; and Seward, Thomas P., III, 4,125,404, Cl. 106-54.000.
Araujo, Roger J.; Borrelli, Nicholas F.; Chodak, Jan B.; Hares, George B.; Meiling, Gerald S.; and Seward, Thomas P., III, 4,125,405, Cl. 106-54.000.
SGS-ATES Componenti Elettronici S.p.A.: *See*—
Paletto, Raimondo, 4,125,740, Cl. 174-52.0PE.
Sharp Corporation: *See*—
Davie, John H., Jr.; Hulick, Martin E.; and Verespy, Stephen J., Jr., 4,125,190, Cl. 206-532.000.
Shatto, Walter C., Jr., to AMP Incorporated. Apparatus for locating wires in predetermined co-planar relationship to each other. 4,125,137, Cl. 140-147.000.
Shaw, Ted G. Safety garment for automobile repairs. 4,124,903, Cl. 2-79.000.
Shell Oil Company: *See*—
Badmin, John S.; and Jones, Richard F., 4,125,613, Cl. 424-250.000.
Downing, Roger S.; van Amstel, Jan; and Joustra, Annie H., 4,125,483, Cl. 252-455.00R.
Gray, Robin T.; and De Jong, Aaldert J., 4,125,484, Cl. 252-522.000.
Maxwell, Ian E., 4,125,480, Cl. 252-414.000.
Shelton, Gerald L.: *See*—
Hierholzer, Frank J., Jr.; Ancona, John A.; and Shelton, Gerald L., 4,125,756, Cl. 219-121.0LM.
Shepardson, Robert C.: *See*—
Cashel, Aloysius T.; Perna, Frank; Trussell, Gerald C.; D'Souza, Alfred C.; Karlin, Richard A.; Caruth, James R.; Van Ermen, Gary L.; Arnston, Robert W.; Comiskey, Gary F.; Borgens, Frederick R.; Kreft, Keith A.; Damm, Arthur; Sienaski, Dennis C.; Shepardson, Robert C.; Leung, Yam C.; and Jankowski, Thomas M., 4,125,894, Cl. 364-442.000.
Sherlock, Margaret H., to Schering Corporation. N-1-(p-Biphenylalk-

yl)piperazines and their use as anti-inflammatory agents. 4,125,612, Cl. 424-250.000.

Sherwin-Williams Company, The: *See—*
Stvan, Otto J.; and Brodie, Mary G., 4,125,678, Cl. 428-514.000.

Shields, Clark R.: *See—*
Scheifley, John C.; Shields, Clark R.; and Busby, David E., 4,125,593, Cl. 423-481.000.

Shimomura, Hiromi: *See—*
Sugie, Akihiko; Shimomura, Hiromi; Katsube, Junki; and Yamamoto, Hisao, 4,125,731, Cl. 560-53.000.

Shinoda, Nobuhiko; Sakurada, Nobuaki; Ito, Tadashi; Yamamichi, Masayoshi; Murakami, Hiroyasu; and Suzuki, Masayuki, to Canon Kabushiki Kaisha. Digital information conversion system. 4,125,832, Cl. 340-347.0DD.

Shinoda, Yoshio: *See—*
Kinoshita, Toshiharu; Shinoda, Yoshio; Oyamada, Takashi; Masuda, Mitsuo; and Arai, Noritomo, 4,125,749, Cl. 179-99.000.

Shintani, Sotokichi: *See—*
Kawai, Kazuo; Tamori, Michitoshi; Yanagidaira, Hidetaka; and Shintani, Sotokichi, 4,125,899, Cl. 364-724.000.

Shiraishi, Masao: *See—*
Yamamoto, Akira; Shiraishi, Masao; Isozumi, Masakatu; and Yoshikawa, Masato, 4,125,699, Cl. 526-169.200.

Shmelev, Anatoly N.: *See—*
Iljunin, Vladimir G.; Murogov, Viktor M.; Troyanov, Mikhail F.; Rineisky, Anatoly A.; and Shmelev, Anatoly N., 4,125,433, Cl. 176-68.000.

Shoup, Floyd K.: *See—*
Rao, Ganta V.; and Shoup, Floyd K., 4,125,528, Cl. 260-112.00G.

Shropshire, Joseph A.; and Tsien, Hsue C., to Exxon Research & Engineering Co. Bipolar carbon-plastic electrode structure-containing multicell electrochemical device and method of making same. 4,125,680, Cl. 429-4.000.

Shuler, Lucien B., to Caterpillar Tractor Co. Actuating mechanism for hydrostatic transmission. 4,125,032, Cl. 74-96.000.

Siefert, James D.: *See—*
Smith, George E.; and Siefert, James D., 4,125,069, Cl. 100-45.000.

Siemens Aktiengesellschaft: *See—*
Reuschel, Konrad; Dietze, Wolfgang; and Rucha, Ulrich, 4,125,643, Cl. 427-9.000.

Siempelkamp Giesserei GmbH & Co.: *See—*
Schilling, Franz, 4,125,202, Cl. 220-3.000.

Sienaski, Dennis C.: *See—*
Cashel, Aloysius T.; Perna, Frank; Trussell, Gerald C.; D'Souza, Alfred C.; Karlin, Richard A.; Caruth, James R.; Van Ermen, Gary L.; Arnston, Robert W.; Comiskey, Gary F.; Borgens, Frederick R.; Kreft, Keith A.; Damm, Arthur; Sienaski, Dennis C.; Shepardson, Robert C.; Leung, Yam C.; and Jankowski, Thomas M., 4,125,894, Cl. 364-442.000.

Silonics, Inc.: *See—*
Stevenson, Richard G., Jr., 4,125,845, Cl. 346-140.00R.

Silver, Harry. Photoelectric switch and dimmer control. 4,125,767, Cl. 250-214.00D.

Silverman, Alan: *See—*
Vosti, Donald C.; and Silverman, Alan, 4,125,632, Cl. 426-111.000.

Simmons, Joseph C.: *See—*
Dhuyvetter, Henry J.; Engelder, Paul D.; and Simmons, Joseph C., 4,125,017, Cl. 73-178.00R.

Sims, William B., Jr.: *See—*
Hudspeth, Emmett L.; Richardson, Philip C.; Neathery, John L., Jr.; Dykstra, Jerald P.; Boger, Allen D., Jr.; Sims, William B., Jr.; Hunt, Glenn E.; and Quisenberry, Tony M., 4,125,111, Cl. 128-2.05T.

Singer Company, The: *See—*
DeHart, David A.; and Ridgell, James J., Jr., 4,125,898, Cl. 364-718.000.
Fromknecht, Charles T., 4,124,916, Cl. 15-339.000.
Stavis, Gus, 4,125,836, Cl. 343-102.000.
Whitby, Clyde M., 4,125,843, Cl. 346-17.000.

Sinha, Rabindra K., to Merck & Co., Inc. Method of preparing magnesium oxide impregnated activated carbon. 4,125,482, Cl. 252-447.000.

Sipp, Steven O.; Schmidt, Gary M.; and Venaleck, John T., to A P Products Incorporated. Electrical connection device. 4,125,313, Cl. 339-176.00M.

Sjogren, Axel O., to Gates Rubber Company, The. Rechargeable battery enclosure. 4,125,681, Cl. 429-99.000.

SKF Kugellagerfabriken GmbH: *See—*
Stenzinger, Karlheinz, 4,125,181, Cl. 192-98.000.

Slurry Systems, Inc.: *See—*
Schmednecht, Fred C., 4,125,332, Cl. 366-33.000.

Smart, Anthony E., to Rolls-Royce Limited. Apparatus for laser anemometry. 4,125,778, Cl. 250-574.000.

SMG-Suddeutsche Maschinenbau GmbH: *See—*
Adam, Klaus, 4,125,010, Cl. 72-453.060.

Smith, George E.; and Siefert, James D., to Union Carbide Corporation. Control system for refuse pelletizing process. 4,125,069, Cl. 100-45.000.

Smith, Herman W., to Upjohn Company, The. 5-Oxa-13,14-didehydro-11-deoxy-PGE$_1$ compounds. 4,125,734, Cl. 560-121.000.

Smith International, Inc.: *See—*
Evans, Robert F.; and Allen, James H., 4,125,167, Cl. 175-65.000.

Smith, John C., Jr.: *See—*
Kummins, Joel S.; and Smith, John C., Jr., 4,125,507, Cl. 260-31.4EP.

Smith, Kenneth R., to Mallinckrodt, Inc. Polyhydroxy-alkyl-3,5-disubstituted-2,4,6-triiodocarbanilates. 4,125,709, Cl. 536-53.000.

Smithkline Corporation: *See—*
Hill, David T.; Lantos, Ivan; and Sutton, Blaine M., 4,125,710, Cl. 536-121.000.
Hill, David T.; Lantos, Ivan; and Sutton, Blaine M., 4,125,711, Cl. 536-121.000.

Snajdr, Edward A.: *See—*
Friedrichs, James R.; Snajdr, Edward A.; and Klaudinyi, Bela, 4,125,409, Cl. 106-66.000.

Societa' Farmaceutici Italia S.p.A.: *See—*
Arcamone, Federico; Bernardi, Luigi; Giardino, Pietro; and di Marco, Aurelio, 4,125,607, Cl. 424-180.000.
Arcamone, Federico; and Cassinelli, Giuseppe, 4,125,707, Cl. 536-17.000.

Societe d'Assistance Technique S.A. pour Produits Nestle: *See—*
Buhler, Marcel; Bohren, Hans-Ueli; Hodel, Theodore; and Wenner, Valentin, 4,125,527, Cl. 260-112.00R.

Soininen, Mauri: *See—*
Ohls, Per-Erik; and Soininen, Mauri, 4,124,942, Cl. 34-115.000.

Solvay & Cie: *See—*
Degueldre, Louis; and Nicolas, Edgard, 4,125,450, Cl. 204-296.000.

Sony Corporation: *See—*
Fujimoto, Kazumi; and Iribe, Toshio, 4,125,189, Cl. 206-387.000.
Hong, Sung D.; Boggs, Ray; and Takei, Shinzo, 4,125,088, Cl. 118-301.000.

Sorenson, Jess F. Automatic lathe with rotary cutter. 4,124,927, Cl. 29-37.00A.

Sotoyama, Kaoru: *See—*
Kizu, Fumio; Hanano, Kazuyoshi; Sotoyama, Kaoru; and Matsuo, Masayoshi, 4,125,399, Cl. 75-125.000.

Sovari, Janos; and Budai, Geza J. Twist can top. 4,125,203, Cl. 220-258.000.

Sowman, Harold G., to Minnesota Mining and Manufacturing Company. Alumina-chromia-metal (IV) oxide refractory fibers having a microcrystalline phase. 4,125,406, Cl. 106-57.000.

Soya, Masataka: *See—*
Tani, Akira; Yuasa, Yoshiyuki; Watanabe, Atsushi; An, Bunzai; Soya, Masataka; and Tanabe, Hiromi, 4,125,477, Cl. 252-301.10W.

Spector, George: *See—*
Kroh, Norma J.; and Spector, George, 4,125,046, Cl. 83-437.000.
MacLean, Ewen M.; and Spector, George, 4,125,232, Cl. 244-12.300.

Speedie, Robert, to W. A. Deutsher Pty Ltd. Retaining means. 4,124,922, Cl. 24-115.00R.

Speier, John L., to Dow Corning Corporation. Preparation of alkyl polysulfides. 4,125,552, Cl. 260-448.80R.

Spence-Bate, Harry A. H. Copying apparatus. 4,125,324, Cl. 355-23.000.

Sperry Rand Corporation: *See—*
Bernhardt, Richard P., 4,124,970, Cl. 56-10.200.
Young, Robert G., 4,125,071, Cl. 100-191.000.

Spielau, Paul: *See—*
Alfter, Franz; Breitscheidel, Hans-Ulrich; and Spielau, Paul, 4,125,351, Cl. 425-403.000.

Spiertz, Elisabeth J.; Flinsenberg, Christiaan F. W.; and van Beek, Leendert K. H., to U.S. Philips Corporation. Method of making copies of information tracks on carriers. 4,125,401, Cl. 96-49.000.

Spiroll Corporation Ltd.: *See—*
Martens, Ernst, 4,125,348, Cl. 425-64.000.

SRI International: *See—*
Henry, David W.; and Tong, George L., 4,125,704, Cl. 536-4.000.

Srodes, Paul G.: *See—*
Higashide, Carlos S.; and Srodes, Paul G., 4,125,874, Cl. 364-900.000.

Sroussi, Roland, to Thomson-CSF. Polycrystalline ferrimagnetic garnet having a narrow gyromagnetic resonance line width and a low magnetic moment. 4,125,473, Cl. 252-62.570.

Stabler, Howard G., to TBA Industrial Products Limited. Manufacture of moulding materials. 4,125,514, Cl. 260-42.150.

Stach, Leonard J., to Velsicol Chemical Corporation. N-Tetrahydropyranyl substituted phosphoramidates and phosphonamidates. 4,125,542, Cl. 260-345.100.

Stachurski, John Z. O. Direct energy conversion device. 4,125,122, Cl. 136-205.000.

Stahl, Robert M., to Bio-Dynamics Inc. Method for production of centrifugal release bag. 4,124,965, Cl. 53-412.000.

Stahlberger, Bruno; and von Dach, Werner. Preparation for the manufacture of films comprising a collagenous material and liquid reaction product of a high molecular weight water-insoluble, organic material. 4,125,631, Cl. 426-105.000.

Stahle, Helmut; Koppe, Herbert; Kummer, Werner; and Hoefke, Wolfgang, to Boehringer Ingelheim GmbH. 2-[(2',6'-Disubstituted-phenyl)-imino]-imidazolidines and salts thereof. 4,125,620, Cl. 424-273.00R.

Stainless Equipment Company: *See—*
Molitor, Victor D., 4,125,148, Cl. 165-2.000.

Standard Oil Company a corporation of Indiana: *See—*
Vienna, Paul C.; Den Herder, Marvin J.; and Zletz, Alex, 4,125,471, Cl. 252-31.000.

Standley, Wendell E., to Abbott Laboratories. Washing apparatus for containers. 4,125,120, Cl. 134-126.000.

Standridge, Robert T., to Bristol-Myers Company. Substituted 5-phenyl-2,3,4,5-tetrahydro-1,4-benzoxazepines. 4,125,538, Cl. 260-326.5CA.

Stansfield, James F.: *See—*
Davies, Peter K.; Stansfield, James F.; and Topham, Arthur, 4,125,413, Cl. 106-308.00Q.

Stark, Alfred. Injection-molding installation, particularly for the production of footwear. 4,125,353, Cl. 425-576.000.
Stark, Martin H. Propeller shaft liner and inserting apparatus. 4,124,928, Cl. 29-235.000.
Stauffer Chemical Company: *See*—
Pallos, Ferenc M., 4,125,627, Cl. 424-326.000.
Stavis, Gus, to Singer Company, The. Electrically scanned antenna system and modulator for omnidirectional radio range. 4,125,836, Cl. 343-102.000.
Stedman, David: *See*—
Eige, John J.; Patel, Arvind M.; Roberts, Spencer D.; and Stedman, David, 4,125,881, Cl. 360-50.000.
Steelman, Melvin W.: *See*—
Kennedy, Thomas E.; Butts, Earl E.; and Steelman, Melvin W., 4,124,996, Cl. 62-256.000.
Steidl, Robert E., to International Telephone and Telegraph Corporation. Method and apparatus for signaling and framing in a time division multiplex communication system. 4,125,745, Cl. 179-15.0BY.
Stein, Gunter. Fuel injection pump for internal combustion engines. 4,125,104, Cl. 123-179.00L.
Steinberg, David H.: *See*—
Dexter, Martin; and Steinberg, David H., 4,125,516, Cl. 260-45.80N.
Steine, Hans-Theo: *See*—
Wasserman, Rene; Quaas, Joseph; Chalard, Jean-Claude; Noel, Leon; and Steine, Hans-Theo, 4,125,754, Cl. 219-121.00P.
Steingroever, Erich A., to Elektro-Physik. Magnetic thickness gauge having convertible scales. 4,125,807, Cl. 324-230.000.
Steinhof, Dieter; and Kramer, Winfried. Patterning device for a manual knitting machine. 4,125,002, Cl. 66-75.200.
Stensrud, James C.: *See*—
Hansen, Barry J.; Stensrud, James C.; Zambrano, Adolfo R.; and Chilcote, Dennis D., 4,125,588, Cl. 423-150.000.
Stenzinger, Karlheinz, to SKF Kugellagerfabriken GmbH. Clutch disengaging device having a self-centering clutch pressure bearing. 4,125,181, Cl. 192-98.000.
Stephens, Wilbur E., to Alumax, Inc. High velocity billet heater. 4,125,364, Cl. 432-145.000.
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Diana, Guy D.; and Hinshaw, William B., Jr., 4,125,541, Cl. 260-340.50R.
Diana, Guy D.; and Hinshaw, William B., Jr., 4,125,714, Cl. 542-429.000.
Sterndent Corporation: *See*—
French, Park; and Conaway, William H., 4,125,329, Cl. 356-405.000.
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Stevens, Albert F.; and Haley, Paul E., to Opex Corporation. Content activated envelope extraction. 4,124,968, Cl. 53-381.00R.
Stevenson, Richard G., Jr., to Silonics, Inc. Ink jet print head pressure and temperature control circuits. 4,125,845, Cl. 346-140.00R.
Stewart, John K., to Canron, Inc. High speed production tamper compactor. 4,125,075, Cl. 104-7.00B.
Stewart, John K., Jr.: *See*—
Chen, Peter C.; Stewart, John K., Jr.; and Koo, Tuh-Kai, 4,125,427, Cl. 156-657.000.
Stillwell Manufacturing Corp.: *See*—
Stillwell, Nicholas, 4,125,141, Cl. 160-91.000.
Stillwell, Nicholas, to Stillwell Manufacturing Corp. Self draining frame structure. 4,125,141, Cl. 160-91.000.
Stingl, Hans A.; and Elliott, John, to Toms River Chemical Corp. Metallized monoazo dyes. 4,125,368, Cl. 8-42.00B.
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Linnerz, Wilhelm; Stodt, Eberhardt; and Kaldenbach, Erwin, 4,125,068, Cl. 100-19.00R.
Stokes, Thomas P., to Tree Top, Inc. Apparatus for facilitating separation of peel from produce. 4,125,066, Cl. 99-534.000.
Stolle Corporation, The: *See*—
Byrd, James I.; and Kaminski, Elton G., 4,125,009, Cl. 72-350.000.
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Hicks, John E.; and Stolley, Ronald M., 4,125,284, Cl. 296-62.000.
Stoneberg, James H. Heat exchanger. 4,125,153, Cl. 165-166.000.
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Campbell, Larry E.; and Stookey, Stanley D., 4,125,651, Cl. 427-372.00B.
Stotts, Larry B.; and Catano, Paul S., to United States of America, Navy. Integrated optical matrix multiplier. 4,125,316, Cl. 350-96.130.
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Stratienko, Andrew, to Dresser Industries, Inc. Magnetic mechanical disconnect. 4,125,790, Cl. 310-75.00D.
Stuart, Linden, Jr.; and Davis, Harry R., to Stuart Steel Protection Corporation. Pipe wrapping machine. 4,125,422, Cl. 156-394.000.
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Ziegler, Karl; Breil, Heinz; Martin, Heinz; and Holzkamp, Erhard, 4,125,698, Cl. 526-159.000.
Stvan, Otto J.; and Brodie, Mary G., to Sherwin-Williams Company, The. Radiation polymerizable compositions. 4,125,678, Cl. 428-514.000.
Su, Yao-Sin; and Sugawara, Ken F., to Corning Glass Works. Purification of hydrofluoric acid etching solutions with weak anion exchange resins. 4,125,594, Cl. 423-488.000.
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Lewis, David L.; Schenke, Larry A.; Suchanski, Mary R.; and Franks, C. Richard, deceased, 4,125,449, Cl. 204-290.00F.
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Fromel, Gustav; Suchy, Peter; and Ulrych, Gerhard, 4,125,434, Cl. 176-76.000.
Suga, Shigeru. Apparatus for measuring reflectivity and transmissivity of a specimen. 4,125,328, Cl. 356-73.000.
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Sugawara, Shungo: *See*—
Kakuchi, Masami; Sugawara, Shungo; Murase, Kei; and Matsuyama, Kentaro, 4,125,672, Cl. 428-421.000.
Sugie, Akihiko; Shimomura, Hiromi; Katsube, Junki; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Novel indan derivatives. 4,125,731, Cl. 560-53.000.
Sugio, Akitoshi; Takeda, Mutsuhiko; Mizutani, Makoto; and Suzumori, Takeo, to Mitsubishi Gas Chemical Company, Inc. Process for stabilizing trioxane. 4,125,540, Cl. 260-340.000.
Sullivan, Edward J.; and Jones, Giffin D., to Dow Chemical Company, The. Air treating gel employing amide polymer gelling agent. 4,125,478, Cl. 252-316.000.
Sumida, Shizuo, to Toyo Kogyo Co., Ltd. Digital fuel quantity indicators. 4,125,022, Cl. 73-313.000.
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Yamade, Hirotada; Nakagome, Takenari; and Komatsu, Toshiaki, 4,125,611, Cl. 424-246.000.
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Nakamura, Nobutaka; and Saeki, Yukio, 4,125,502, Cl. 260-29.300.
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Sekiguchi, Sadao; Matsumuto, Kojiro; Ishikawa, Tetsuo; Mishiba, Saburo; and Izaki, Nobujiro, 4,125,675, Cl. 428-483.000.
Summers, James J.: *See*—
Seres, Robert J.; and Summers, James J., 4,124,902, Cl. 2-10.000.
Sun Electric Corporation: *See*—
Cashel, Aloysius T.; Perna, Frank; Trussell, Gerald C.; D'Souza, Alfred C.; Karlin, Richard A.; Caruth, James R.; Van Ermen, Gary L.; Arnston, Robert W.; Comiskey, Gary F.; Borgens, Frederick R.; Kreft, Keith A.; Damm, Arthur; Sienaski, Dennis C.; Shepardson, Robert C.; Leung, Yam C.; and Jankowski, Thomas M., 4,125,894, Cl. 364-442.000.
Sun, Shan C., to Westinghouse Electric Corp. Apparatus for detecting subsynchronous current in power systems. 4,125,884, Cl. 361-79.000.
Sundstrand Corporation: *See*—
Van Schoiack, Michael M., 4,125,789, Cl. 307-296.00R.
Sunobe, Kazuhiro: *See*—
Yoshinaga, Yoichi; Mishina, Haruo; and Sunobe, Kazuhiro, 4,125,345, Cl. 417-243.000.
Suominen, Heikki S. Plastic shopping bag having a reinforced handle portion. 4,125,220, Cl. 229-54.00R.
Superior Electric Company, The: *See*—
Leenhouts, Albert C., 4,125,801, Cl. 318-696.000.
Susi, Peter V., to American Cyanamid Company. 1-Oxa-4-azaspiro[4,5]-decanes as light stabilizers for polymers. 4,125,518, Cl. 260-45.8NZ.
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Hill, David T.; Lantos, Ivan; and Sutton, Blaine M., 4,125,710, Cl. 536-121.000.
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Suzuki, Katsunori: *See*—
Nagase, Hiroshi; Okuyama, Toshiaki; Kubota, Yuzuru; and Suzuki, Katsunori, 4,125,796, Cl. 318-175.000.
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Suzuki, Masayasu: *See*—
Kaneko, Akira; Ohya, Masaki; Suzuki, Masayasu; and Kobayashi, Akio, 4,125,654, Cl. 428-64.000.
Suzuki, Masayuki: *See*—
Shinoda, Nobuhiko; Sakurada, Nobuaki; Ito, Tadashi; Yamamichi, Masayoshi; Murakami, Hiroyasu; and Suzuki, Masayuki, 4,125,832, Cl. 340-347.0DD.
Suzuki, Seigo; and Moriya, Yoshiaki, to Tokyo Shibaura Electric Co., Ltd. Information transfer control system. 4,125,870, Cl. 364-900.000.
Suzumori, Takeo: *See*—
Sugio, Akitoshi; Takeda, Mutsuhiko; Mizutani, Makoto; and Suzumori, Takeo, 4,125,540, Cl. 260-340.000.
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Krob, Erwin; and Svoboda, Josef, 4,125,275, Cl. 280-626.000.
Kubelka, Axel R.; and Svoboda, Josef, 4,125,274, Cl. 280-618.000.
Swain, James C. Coupler for two eccentrically rotating members. 4,125,031, Cl. 74-63.000.

Swan, George A.: *See—*
Clem, Kenneth R.; Swan, George A.; and Dauber, Louis, 4,125,454, Cl. 208-65.000.
Swartz, Richard L.: *See—*
Stovall, Milton A.; and Swartz, Richard L., 4,125,255, Cl. 271-251.000.
Sweetheart Plastic, Inc.: *See—*
Brown, Gaylord W., 4,125,350, Cl. 425-381.000.
Sweitzer, Ralph W.: *See—*
Hays, Herbert G.; and Sweitzer, Ralph W., 4,125,151, Cl. 165-58.000.
Swiderski, Kazimierz, to Canada Square Management Ltd. Air conditioning systems for buildings. 4,124,998, Cl. 62-442.000.
Swiss Fabricating, Inc.: *See—*
Lienhard, Robert W., 4,125,174, Cl. 182-128.000.
Takashio, Masahiko: *See—*
Uzumaki, Mitsutaka; Takashio, Masahiko; and Utsumi, Tadayoshi, 4,125,486, Cl. 521-32.000.
Takata, Masanori, to Hitachi, Ltd. Non-destructive screening device for glass diode. 4,125,806, Cl. 324-158.00D.
Takeda Chemical Industries, Ltd.: *See—*
Nagamatsu, Kazuo; Yasuhara, Tadao; Oi, Masakazu; and Maeda, Hideaki, 4,125,805, Cl. 324-54.000.
Takeda, Mutsuhiko: *See—*
Sugio, Akitoshi; Takeda, Mutsuhiko; Mizutani, Makoto; and Suzumori, Takeo, 4,125,540, Cl. 260-340.000.
Takei, Shinzo: *See—*
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Takeshita, Junichiro: *See—*
Akiyama, Yoshinori; Kurami, Kenshi; Takeshita, Junichiro; and Furuya, Takeo, 4,125,277, Cl. 280-745.000.
Takeuchi, Kunio: *See—*
Arai, Yoshiyasu; Anahara, Meiji; Saka, Masanori; Kokubu, Tokio; and Takeuchi, Kunio, 4,124,972, Cl. 57-328.000.
Takeuchi, Yasuhisa; Maio, Kenji; and Matsumoto, Junichiro, to Nissan Motor Company, Ltd.; and Hitachi, Ltd. System for detecting a failure in a vehicle velocity detector and a wheel velocity detector. 4,125,825, Cl. 340-52.00B.
Tamao, Yoshikuni: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,125,604, Cl. 424-177.000.
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,125,619, Cl. 424-267.000.
Tamm, Paul W.; and Kuehler, Christopher W., to Chevron Research Company. Spouted-bed shale retorting process. 4,125,453, Cl. 208-11.00R.
Tamori, Michitoshi: *See—*
Kawai, Kazuo; Tamori, Michitoshi; Yanagidaira, Hidetaka; and Shintani, Sotokichi, 4,125,899, Cl. 364-724.000.
Tamura Electric Works, Ltd.: *See—*
Kinoshita, Toshiharu; Shinoda, Yoshio; Oyamada, Takashi; Masuda, Mitsuo; and Arai, Noritomo, 4,125,749, Cl. 179-99.000.
Tanabe, Hiromi: *See—*
Tani, Akira; Yuasa, Yoshiyuki; Watanabe, Atsushi; An, Bunzai; Soya, Masataka; and Tanabe, Hiromi, 4,125,477, Cl. 252-301.10W.
Tanaka, Eizi; Ohashi, Michihiro; Mochizuki, Hiroshi; and Nishimatsu, Akira, to Nippon Soken, Inc. Fuel control system for internal combustion engine. 4,125,102, Cl. 123-139.0AW.
Tanaka, Taro: *See—*
Noguchi, Masaaki; Tanaka, Yukiyasu; and Tanaka, Taro, 4,125,094, Cl. 123-32.0ST.
Tanaka, Toshie, to Nifco, Inc. Cord holder. 4,125,238, Cl. 248-56.000.
Tanaka, Yukiyasu: *See—*
Noguchi, Masaaki; Tanaka, Yukiyasu; and Tanaka, Taro, 4,125,094, Cl. 123-32.0ST.
Tang, Ching W.; Marchetti, Alfred P.; and Young, Ralph H., to Eastman Kodak Company. Organic photovoltaic elements. 4,125,414, Cl. 136-89.0NB.
Tani, Akira; Yuasa, Yoshiyuki; Watanabe, Atsushi; An, Bunzai; Soya, Masataka; and Tanabe, Hiromi, to Tokyo Shibaura Denki Kabushiki Kaisha. Process for treating radioactive waste gases. 4,125,477, Cl. 252-301.10W.
Tanimoto, Hiroshi: *See—*
Kimura, Tohru; Iwao, Osamu; Kawai, Masahiko; and Tanimoto, Hiroshi, 4,125,674, Cl. 428-469.000.
Tanner, John E., to Laystall Engineering Company Limited. Process for embedding hard particles in a bearing surface. 4,125,637, Cl. 427-198.000.
Tassia, Vincent S., Jr.: *See—*
O'Brien, James T.; Limm, Albert C.; Nyul, Paul; and Tassia, Vincent S., Jr., 4,125,777, Cl. 250-551.000.
Taylor, David L., to Harris Corporation. Simplified output circuit for read only memories. 4,125,880, Cl. 365-242.000.
Taylor, Edwin K.; Williams, James H.; and Kobos, Fred, to Arch Manufacturing Company. Cable winding apparatus and method. 4,124,971, Cl. 57-9.000.
Taylor, Jimmy, to Akzona Incorporated. Yarn twist arrangement. 4,124,974, Cl. 57-339.000.
Taylor, Robert G.: *See—*
Haken, Roger A.; Roberts, Peter C. T.; Taylor, Robert G.; and Traynar, Christopher P., 4,125,818, Cl. 333-70.00T.
TBA Industrial Products Limited: *See—*
Stabler, Howard G., 4,125,514, Cl. 260-42.150.
TEIMEX A.G. IMP-EXP Teilmetallbau: *See—*
Peruffo, Alessandro; and De Barba, Renzo, 4,125,067, Cl. 99-639.000.
Tekrony, Kenneth L.: *See—*
Winker, James A.; and Tekrony, Kenneth L., 4,125,233, Cl. 244-33.000.
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Tenneco Chemicals, Inc.: *See—*
Rudner, Bernard, 4,125,118, Cl. 131-9.000.
Tennis Machines, Inc.: *See—*
Halbrook, Thurman P., 4,125,259, Cl. 273-73.00A.
Teramura, Masao, to Kazuhiko Nakajima. Butterfly valve. 4,125,248, Cl. 251-308.000.
Terry, William A. Apparatus and method for lifting a bop from a wellhead. 4,125,164, Cl. 166-315.000.
Terzian, Rouben T., to Marvin Glass & Associates. Articulated doll. 4,124,952, Cl. 46-44.000.
Texaco Inc.: *See—*
Chesluk, Ralph P.; Askew, John D., Jr.; and Henderson, Clifton C., 4,125,479, Cl. 252-33.600.
Herbstman, Sheldon, 4,125,455, Cl. 208-108.000.
Kolaian, Jack H.; McCoy, Frederic C.; and Patterson, John A., 4,125,475, Cl. 252-89.00R.
Miller, Gordon H., 4,125,513, Cl. 260-42.140.
Texaco Trinidad, Inc.: *See—*
Downer, John D.; and Ragoonanan, Dulcie, 4,125,395, Cl. 71-27.000.
Downer, John D.; and Phillips, Clarence A. L., 4,125,400, Cl. 71-127.000.
Texas Instruments Incorporated: *See—*
Cochran, Michael J.; and Hamilton, Stephen P., 4,125,830, Cl. 340-336.000.
Cochran, Michael J., 4,125,867, Cl. 364-772.000.
Merrow, Thomas E.; Hamilton, Stephen P.; Miles, Larry L.; and Grant, Charles P., Jr., deceased, 4,125,901, Cl. 364-736.000.
Textron, Inc.: *See—*
Carey, Lee F., 4,125,224, Cl. 239-265.430.
Tezuka, Tohru: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,125,604, Cl. 424-177.000.
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,125,619, Cl. 424-267.000.
Thayer, Stephen C., to Owens-Illinois, Inc. Method of making a gaseous discharge display panel with spacer beads in seal frame. 4,125,307, Cl. 316-19.000.
Theriot, Walter A.; Saucier, Steven D.; and Drinkard, B. M., to Mobil Oil Corporation. Removal of carbonyl impurities. 4,125,568, Cl. 260-681.500.
Thermal Syndicate Limited: *See—*
Nichols, Michael J., 4,125,738, Cl. 136-234.000.
Thiokol Corporation: *See—*
Magazzu, Joseph J., 4,125,671, Cl. 428-419.000.
Tholen, Paul; and Finsterwalder, Gerhard, to Klockner-Humboldt-Deutz Aktiengesellschaft. Internal combustion engine with exhaust gas turbo super charger. 4,124,979, Cl. 60-599.000.
Thomas, Richard J., to United States of America, Army. Ammunition rack for tank turret. 4,125,052, Cl. 89-34.000.
Thomson-Brandt: *See—*
Quy Phan, Chi, 4,125,301, Cl. 312-214.000.
Thomson-CSF: *See—*
Picquendar, Jean-Edgar, 4,125,747, Cl. 179-15.0AT.
Sroussi, Roland, 4,125,473, Cl. 252-62.570.
Thorpe, Donald H.: *See—*
Cooke, Victor F. G.; and Thorpe, Donald H., 4,125,702, Cl. 526-323.000.
Thrasher, George E., Jr., to Master Pneumatic-Detroit, Inc. Injection type lubricating apparatus. 4,125,176, Cl. 184-56.00A.
Tidy, Mial R., Jr. Cleaning tool for poultry watering systems. 4,125,121, Cl. 134-167.00C.
Tiefenbacher, Eberhard, to Daimler-Benz Aktiengesellschaft. Radial turbine wheel for a gas turbine. 4,125,344, Cl. 416-183.000.
Timan, Hans, to DuMont Electron Tubes & Devices Corporation. Photomultiplier with dynode support structure. 4,125,793, Cl. 313-95.000.
Tindal, Bobby G. Boat. 4,125,081, Cl. 114-153.000.
Titov, Dmitry V.: *See—*
Komarov, Jury I.; Parshin, Alexei N.; and Titov, Dmitry V., 4,125,134, Cl. 139-436.000.
Tlaker, Erich; and Haseltine, Harold G., to Fellows Corporation. Spindle structure for gear shaping machine or the like. 4,125,056, Cl. 90-7.000.
TMC Corporation: *See—*
Krob, Erwin; and Svoboda, Josef, 4,125,275, Cl. 280-626.000.
Toda, Toshimasa: *See—*
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Toda, Toshimasa; Mori, Eiko; Horiuchi, Hideo; Higashida, Susumu; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Osawa, Hisayou, 4,125,533, Cl. 546-19.000.

Tokunaga, Michio: *See*—
Ohhinata, Ichiro; Okuhara, Shinzi; Kawanami, Mitsuru; and Tokunaga, Michio, 4,125,787, Cl. 307-252.00A.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Tani, Akira; Yuasa, Yoshiyuki; Watanabe, Atsushi; An, Bunzai; Soya, Masataka; and Tanabe, Hiromi, 4,125,477, Cl. 252-301.10W.
Tokyo Shibaura Electric Co., Ltd.: *See*—
Amemiya, Hiroshi; and Abe, Yukito, 4,125,023, Cl. 73-362.0AR.
Suzuki, Seigo; and Moriya, Yoshiaki, 4,125,870, Cl. 364-900.000.
Tolley, Calvert B.: *See*—
Wenstrom, Richard T.; Reinke, Theodore S.; Tolley, Calvert B.; and Brooks, J. Clayton, 4,124,920, Cl. 17-48.000.
Tomlin, Benjamin B. A., to Scholl, Inc. Built-in insole and article of footwear containing same. 4,124,946, Cl. 36-43.000.
Toms River Chemical Corp.: *See*—
Stingl, Hans A.; and Elliott, John, 4,125,368, Cl. 8-42.00B.
Tong, George L.: *See*—
Henry, David W.; and Tong, George L., 4,125,704, Cl. 536-4.000.
Tonomura, Shinji: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,125,604, Cl. 424-177.000.
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,125,619, Cl. 424-267.000.
Topham, Arthur: *See*—
Davies, Peter K.; Stansfield, James F.; and Topham, Arthur, 4,125,413, Cl. 106-308.00Q.
Torii, Kyozo; Koshino, Kenji; Niimi, Yuji; Ogawa, Mashahiro; and Kamo, Keizo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Differential device for vehicles. 4,125,026, Cl. 74-713.000.
Torok, Gabor P.: *See*—
O'Boyle, Leonard E.; and Torok, Gabor P., 4,125,743, Cl. 178-18.000.
Torrington Company, The: *See*—
Ross, William A., 4,125,757, Cl. 219-121.00L.
Torsi, Cosimo B., to Guidotti Internationale S.A. Method for the manufacture of the cis-2-hydroxy-2-phenyl-r-1-cyclohexanecarboxylic acid. 4,125,558, Cl. 562-418.000.
Toru, Ogawa: *See*—
Kamei, Mitsuru; Osamu, Uno; Toru, Ogawa; Yoichiro, Ishii; and Masahiro, Satomi, 4,125,021, Cl. 73-304.00R.
Tosswill, Christopher H.; and Beuscher, Clinton J., to Galileo Electro-Optics Corp. Collimator for X and gamma radiation. 4,125,776, Cl. 250-508.000.
Totten, John. Time telling teaching device. 4,124,945, Cl. 35-39.000.
Towmotor Corporation: *See*—
Lowther, Leslie; and Pawlak, Tadeusz J., 4,125,885, Cl. 361-114.000.
Townson, Thomas: *See*—
Juriss, Ivan B.; Hay, Roger D.; Goodfellow, Andrew C.; Townson, Thomas; and Hay, Keith E., 4,124,964, Cl. 52-745.000.
Toyo Aluminium Kabushiki Kaisha: *See*—
Kimura, Tohru; Iwao, Osamu; Kawai, Masahiko; and Tanimoto, Hiroshi, 4,125,674, Cl. 428-469.000.
Toyo Bseki Kabushiki Kaisha: *See*—
Arai, Yoshiyasu; Anahara, Meiji; Saka, Masanori; Kokubu, Tokio; and Takeuchi, Kunio, 4,124,972, Cl. 57-328.000.
Toyo Kogyo Co., Ltd.: *See*—
Kakui, Kuniaki, 4,125,347, Cl. 418-83.000.
Kizu, Fumio; Hanano, Kazuyoshi; Sotoyama, Kaoru; and Matsuo, Masayoshi, 4,125,399, Cl. 75-125.000.
Sumida, Shizuo, 4,125,022, Cl. 73-313.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Miyanohara, Isao; Miyazaki, Hiroshi; and Kawamura, Hideo, 4,125,466, Cl. 210-67.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Hori, Ryuzo; Masunaga, Kunihiko; Funayama, Toshio; Hoshi, Hirohiko; Ishiguro, Kazuhiko; and Umehara, Hidetomo, 4,125,091, Cl. 123-3.000.
Kawamoto, Junichi; Ito, Yasuo; Ito, Akio; Nakamua, Tamotsu; Nakamura, Motoyuki; Yamaoto, Yoshiaki; and Yonekura, Koji, 4,125,144, Cl. 164-4.000.
Masunaga, Kunihiko; Kani, Masakatsu; Hoshi, Hirohiko; and Ishiguro, Kazuhiko, 4,125,090, Cl. 123-3.000.
Nogami, Tomoyuki, 4,125,291, Cl. 303-24.00F.
Noguchi, Masaaki; Tanaka, Yukiyasu; and Tanaka, Taro, 4,125,094, Cl. 123-32.0ST.
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Stokes, Thomas P., 4,125,066, Cl. 99-534.000.
Tregre, George W. Emergency circulating system for an aircraft hydraulic brake system. 4,125,234, Cl. 244-111.000.
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Trubiano, Antoine. Collapsible seat in end gate for nestable shopping cart. 4,125,270, Cl. 280-33.99B.
True, Martin E., to Weatherford/Lamb, Inc. Power tong apparatus. 4,125,040, Cl. 81-52.500.
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Cashel, Aloysius T.; Perna, Frank; Trussell, Gerald C.; D'Souza, Alfred C.; Karlin, Richard A.; Caruth, James R.; Van Ermen, Gary L.; Arnston, Robert W.; Comiskey, Gary F.; Borgens, Frederick R.; Kreft, Keith A.; Damm, Arthur; Sienaski, Dennis C.; Shepardson, Robert C.; Leung, Yam C.; and Jankowski, Thomas M., 4,125,894, Cl. 364-442.000.
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Reinecke, Erich; and Ulrich, Helmut, 4,125,290, Cl. 303-22.00R.
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Critchfield, Frank E.; Gerkin, Richard M.; and Hawker, Leslie E., 4,125,505, Cl. 260-33.20R.
Cropley, Jean B., 4,125,553, Cl. 260-449.00R.
Smith, George E.; and Siefert, James D., 4,125,069, Cl. 100-45.000.
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Fleck, Raymond N., 4,125,597, Cl. 423-573.00R.
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Agriculture: *See*—
Masri, Merle S.; and Randall, Virginia G., 4,125,708, Cl. 536-20.000.
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Razulis, Marie K., 4,125,376, Cl. 23-230.00R.
Thomas, Richard J., 4,125,052, Cl. 89-34.000.
Vig, John R.; Hafner, Erich; and Andres, Ronald P., 4,125,086, Cl. 118-49.100.

Energy: *See—*
Carlson, Roger D., 4,125,221, Cl. 236-93.00R.
Fowler, T. Kenneth, 4,125,431, Cl. 176-3.000.
Petit, George S.; and Wright, Ralph R., 4,125,642, Cl. 427-8.000.
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Tyson, John E., 4,125,605, Cl. 424-177.000.
Navy: *See—*
Catano, Paul S., 4,125,862, Cl. 358-140.000.
Duffy, James V., 4,125,725, Cl. 544-353.000.
Hitney, Herbert V.; Richter, Juergen H.; and Schefer, Murray H., 4,125,893, Cl. 364-300.000.
Holzman, Allen L., 4,124,976, Cl. 60-204.000.
Kaloi, Cyril M., 4,125,837, Cl. 343-700.0MS.
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Mott, Murray H., 4,125,809, Cl. 325-363.000.
Nielsen, Arnold T., 4,125,728, Cl. 548-356.000.
Stotts, Larry B.; and Catano, Paul S., 4,125,316, Cl. 350-96.130.

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Bretschneider, Hermann; Hueber, Herman P.; Louzil, Friedrich; Fischer, Karl; Jager, Lothar; and Sagan, Johann, 4,125,844, Cl. 346-74.100.
Brissot, Jean-Jacques L. E., 4,125,425, Cl. 156-617.00R.
Cassel, Knut E., 4,125,840, Cl. 343-807.000.
De Brebisson, Michel, 4,124,934, Cl. 29-590.000.
Hartog, Jan; and Zwagemakers, Johannes M. A., 4,125,623, Cl. 424-278.000.
Kohl, Wilhelm; Eibner, Robert; Nolle, Hans-Heinrich; Schneider, Alfred; and Moldovany, Nikolaus-Johann, 4,125,393, Cl. 71-3.000.
Nicholas, Keith H., 4,124,933, Cl. 29-578.000.
Spiertz, Elisabeth J.; Flinsenberg, Christiaan F. W.; and van Beek, Leendert K. H., 4,125,401, Cl. 96-49.000.
Van de Plassche, Rudy J., 4,125,803, Cl. 323-1.000.
van Essen, Hendrik A.; and van Gerwen, Petrus J., 4,125,866, Cl. 364-724.000.
Vinton, David J., 4,125,418, Cl. 148-175.000.

United States Steel Corporation: *See—*
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Hudspeth, Emmett L.; Richardson, Philip C.; Neathery, John L., Jr.; Dykstra, Jerald P.; Boger, Allen D., Jr.; Sims, William B., Jr.; Hunt, Glenn E.; and Quisenberry, Tony M., 4,125,111, Cl. 128-2.05T.

United Technologies Corporation: *See—*
Gordon, Jason M.; and Raber, Peter E., 4,125,317, Cl. 356-376.000.
Maricle, Donald L.; and Nagle, Dennis C., 4,125,676, Cl. 429-38.000.

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Delaunois, Claude L.; and De Graeve, Willy O., 4,125,560, Cl. 260-581.000.

UOP Inc.: *See—*
Antos, George J., 4,125,565, Cl. 260-668.00D.

Upjohn Company, The: *See—*
Axen, Udo F., 4,125,712, Cl. 542-421.000.
Nelson, Norman A., 4,125,713, Cl. 542-426.000.
Peterson, David C., 4,125,546, Cl. 260-408.000.
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Smith, Herman W., 4,125,734, Cl. 560-121.000.

Uraneck, Carl A.; and Burleigh, John E., to Phillips Petroleum Company. Mixing of organosulfur molecular weight modifier with emulsifier for emulsion polymerization systems. 4,125,481, Cl. 252-431.00C.

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Komminoth, Paul; Robinson, Tibor; and Urosevic, Milica, 4,125,652, Cl. 427-390.00C.

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Vaida, Peter P. Level and method of assembling same. 4,124,940, Cl. 33-379.000.

Valeev, Rustem I.: *See—*
Buzhinsky, Vladimir L.; Raschepkin, Konstantin E.; Dunjushkin, Mikhail G.; Lysogorsky, Gennady T.; Valeev, Rustem I.; Nisenbaum, Yakov A.; and Ikhsanov, Deviz F., 4,124,914, Cl. 15-93.00R.

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Downing, Roger S.; van Amstel, Jan; and Joustra, Annie H., 4,125,483, Cl. 252-455.00R.

van Beek, Leendert K. H.: *See—*
Spiertz, Elisabeth J.; Flinsenberg, Christiaan F. W.; and van Beek, Leendert K. H., 4,125,401, Cl. 96-49.000.

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Bugaut, Andree; and Vandenbossche, Jean-Jacques, 4,125,367, Cl. 8-11.000.

Van de Plassche, Rudy J., to U.S. Philips Corporation. Current distribution arrangement for realizing a plurality of currents having a specific very accurately defined ratio relative to each other. 4,125,803, Cl. 323-1.000.

van der Burg, Willem J., to Akzona Incorporated. Amino-substituted tetracyclic compounds. 4,125,718, Cl. 544-145.000.

Vander Lugt, Thomas, Jr., to Brown Company. Bacon or like container, blank therefor, bacon package and method of packaging bacon therein. 4,125,633, Cl. 426-121.000.

Van Ermen, Gary L.: *See—*
Cashel, Aloysius T.; Perna, Frank; Trussell, Gerald C.; D'Souza, Alfred C.; Karlin, Richard A.; Caruth, James R.; Van Ermen, Gary L.; Arnston, Robert W.; Comiskey, Gary F.; Borgens, Frederick R.; Kreft, Keith A.; Damm, Arthur; Sienaski, Dennis C.; Shepardson, Robert C.; Leung, Yam C.; and Jankowski, Thomas M., 4,125,894, Cl. 364-442.000.

van Essen, Hendrik A.; and van Gerwen, Petrus J., to U.S. Philips Corporation. Non-recursive discrete filter. 4,125,866, Cl. 364-724.000.

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van Essen, Hendrik A.; and van Gerwen, Petrus J., 4,125,866, Cl. 364-724.000.

Vango (Scotland) Limited: *See—*
Raymond, Jean-Francois, 4,124,910, Cl. 9-2.00C.

Van Laethem, Robert, to BFG Glassgroup. Process of forming a metal or metal compound coating on a face of a glass substrate and apparatus suitable for use in forming such coating. 4,125,391, Cl. 65-60.00D.

Vann, Roy R. Method and apparatus for isolating and treating subsurface stratas. 4,125,159, Cl. 166-285.000.

VanOrnum, James H.: *See—*
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Van Schoiack, Michael M., to Sundstrand Corporation. Biasing and scaling circuit for transducers. 4,125,789, Cl. 307-296.00R.

Vari-L Company, Inc.: *See—*
Pavio, Anthony M., 4,125,810, Cl. 325-446.000.

Varner, David O.; and DeForest, Sherman E. Cam-action axle carrier apparatus. 4,125,268, Cl. 280-11.280.

Varta Batterie Aktiengesellschaft: *See—*
von Dohren, Hans, 4,125,378, Cl. 422-202.000.

Vecchiotti, Camillo M., to Amerace Corporation. Thermoplastic casing and method of manufacturing same. 4,125,187, Cl. 206-333.000.

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Fleischer, Donald W., 4,125,762, Cl. 235-92.0FL.

Velsicol Chemical Corporation: *See—*
Stach, Leonard J., 4,125,542, Cl. 260-345.100.

Venaleck, John T.: *See—*
Sipp, Steven O.; Schmidt, Gary M.; and Venaleck, John T., 4,125,313, Cl. 339-176.00M.

Venghiattis, Alexis A., to Perkin-Elmer Corporation, The. Corrosion-free nebulizer. 4,125,225, Cl. 239-338.000.

Veranneman, Georg: *See—*
Sadjina, Heinz; and Veranneman, Georg, 4,124,997, Cl. 62-320.000.

Vercesi, Giampiero: *See—*
Molteni, Luigi; Ramirez Fernandez, Jose A.; Scrollini, Franco; and Vercesi, Giampiero, 4,125,616, Cl. 424-263.000.

Verespy, Stephen J., Jr.: *See—*
Davie, John H., Jr.; Hulick, Martin E.; and Verespy, Stephen J., Jr., 4,125,190, Cl. 206-532.000.

Verlander, Michael S.: *See—*
Goodman, Murray; Verlander, Michael S.; and Fuller, William D., 4,125,519, Cl. 528-363.000.

Vermillon, Frederick J., Jr.: *See—*
Klowak, Bernard G.; Pauls, Walter L.; and Vermillon, Frederick J., Jr., 4,125,659, Cl. 428-153.000.

Vida, Julius A.: *See—*
Samour, Carlos M.; and Vida, Julius A., 4,125,621, Cl. 424-275.000.

Vienna, Paul C.; Den Herder, Marvin J.; and Zletz, Alex, to Standard Oil Company a corporation of Indiana. Sulfurized oil. 4,125,471, Cl. 252-31.000.

Vierbicky, Van L., to National Steel Corporation. Molten metal sampling device. 4,125,024, Cl. 73-425.40R.

Vig, John R.; Hafner, Erich; and Andres, Ronald P., to United States of America, Army. Nozzle beam type metal vapor source. 4,125,086, Cl. 118-49.100.

Viking Jersey Equipment Ltd.: *See—*
Adler, Walter M., 4,124,991, Cl. 405-166.000.

Vineland Laboratories, Inc.: *See—*
Goldhaft, Tevis M.; Kaitz, Charles; and Maier, George D., 4,125,628, Cl. 424-329.000.

Vinton, David J., to U.S. Philips Corporation. Utilization of a substrate alignment marker in epitaxial deposition processes. 4,125,418, Cl. 148-175.000.

Vivitar Corporation: *See—*
Altman, Richard M.; and Badkar, Ravindra K., 4,125,315, Cl. 350-96.100.

Volvo Car B.V.: *See—*
Botz, Hans D., 4,125,170, Cl. 180-69.00C.

von Dach, Werner: *See—*
Stahlberger, Bruno; and von Dach, Werner, 4,125,631, Cl. 426-105.000.

von der Eltz, Hans-Ulrich: *See—*
Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 4,124,941, Cl. 34-18.000.

von Dohren, Hans, to Varta Batterie Aktiengesellschaft. Vibratory chemical reactor having insulation which acquires an electrostatic charge during vibration. 4,125,378, Cl. 422-202.000.

von Dolsperg, Helmut: *See*—
Hesse, Gunther; Strassnitzki, Manfred; and von Dolsperg, Helmut, 4,125,055, Cl. 89-33.0SF.

von Holdt, John W. Pivot assembly mold apparatus. 4,125,246, Cl. 249-58.000.

Vonsovsky, Alexandr M.: *See*—
Ryabenko, Evgeny A.; Bljum, Grigory Z.; Naida, Tatyana B.; Golub, Alexandr E.; Galchina, Natalya I.; Aronov, Alexandr R.; Semenova, Natalya F.; Raginskaya, Ljudmila K.; and Vonsovsky, Alexandr M., 4,125,596, Cl. 423-522.000.

Vosti, Donald C.; and Silverman, Alan, to American Can Company. Container. 4,125,632, Cl. 426-111.000.

Vostovich, Joseph E., to General Electric Company. Flame and heat resistant ethylene-propylene rubber. 4,125,509, Cl. 260-33.6AQ.

Vratny, Frederick, to Bell Telephone Laboratories, Incorporated. Electroless deposition of nickel on aluminum. 4,125,648, Cl. 427-305.000.

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Buzhinsky, Vladimir L.; Raschepkin, Konstantin E.; Dunjushkin, Mikhail G.; Lysogorsky, Gennady T.; Valeev, Rustem I.; Nisenbaum, Yakov A.; and Ikhsanov, Deviz F., 4,124,914, Cl. 15-93.00R.

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W. A. Deutsher Pty Ltd.: *See*—
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W. R. Grace & Co.: *See*—
Ketley, Arthur D.; and Morgan, Charles R., 4,125,644, Cl. 427-36.000.

WABCO Westinghouse: *See*—
Durraffourt, Jean F., 4,125,177, Cl. 188-62.000.

WABCO Westinghouse GmbH: *See*—
Reinecke, Erich; and Ulrich, Helmut, 4,125,290, Cl. 303-22.00R.
Ruhnau, Gerhard; and Gudat, Wolfgang, 4,125,295, Cl. 303-95.000.

Wacker-Chemie GmbH: *See*—
Roth, Michael; and Gluck, Herbert, 4,125,673, Cl. 428-447.000.

Wagner, David P.: *See*—
Herkes, Daniel J.; and Wagner, David P., 4,125,051, Cl. 85-45.000.

Wagner, William C. Compressed air engine. 4,124,978, Cl. 60-410.000.

Wahl, Ralph E.; and Bruhin, Alfred C., to General Electric Company. Differentially compressed, multi-layered, concentric cross lay stranded cable electrical conductor, and method of forming same. 4,125,741, Cl. 174-120.0SC.

Wainwright, Stanley: *See*—
Grant, Albert E.; and Wainwright, Stanley, 4,125,443, Cl. 204-60.000.

Waite, Jerry M.; Burdyn, Ralph F.; and Savins, Joseph G., to Mobil Oil Corporation. Oil recovery process employing a hydrocarbon slug and a thickened aqueous surfactant slug. 4,125,158, Cl. 166-273.000.

Wallch, Alfred H. Magnetic particle toy with magnetic retaining means. 4,124,951, Cl. 46-238.000.

Wallsten, Hans I., to Inventing S.A. Method for applying a coating composition onto a moving paperweb. 4,125,641, Cl. 427-296.000.

Walser, Armin; Fryer, Rodney I.; and Benjamin, Louis, to Hoffmann-La Roche Inc. Imidazo[1,5-a][1,4]benzodiazepines. 4,125,726, Cl. 548-302.000.

Wambach, Allen D.: *See*—
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Wang Laboratories, Inc.: *See*—
Chu, Ge Y., 4,125,336, Cl. 400-124.000.

Wang, Tse-Lin: *See*—
Nahabedian, Charles E.; VanOrnum, James H.; Wang, Tse-Lin; and Weiss, Carl D., 4,125,748, Cl. 179-18.0BD.

Wangermann, Jochen, to Gruner & Jahr AG & Co. Method of providing a stack of predetermined length and apparatus for performing said method. 4,125,253, Cl. 270-58.000.

Warner-Lambert Company: *See*—
Meierhoefer, Eugene J., 4,125,186, Cl. 206-221.000.

Wasemann, William A., to White-Westinghouse Corporation. Sump strainer for tumbler washing machine. 4,125,003, Cl. 68-208.000.

Wasserman, Rene; Quaas, Joseph; Chalard, Jean-Claude; Noel, Leon; and Steine, Hans-Theo. Installation for surfacing using plasma-arc welding. 4,125,754, Cl. 219-121.00P.

Watanabe, Atsushi: *See*—
Tani, Akira; Yuasa, Yoshiyuki; Watanabe, Atsushi; An, Bunzai; Soya, Masataka; and Tanabe, Hiromi, 4,125,477, Cl. 252-301.10W.

Watanabe, Hiroshi, to Nippon Electric Co., Ltd. Memory circuit. 4,125,878, Cl. 365-208.000.

Watanabe, Jun; Ohta, Akira; and Kobayashi, Shigeo, to Matsushita Electric Industrial Co., Ltd. Dry cells with stainless steel current collector. 4,125,638, Cl. 429-199.000.

Watanabe, Shoji: *See*—
Murakami, Yasukazu; Kubo, Masayoshi; and Watanabe, Shoji, 4,125,521, Cl. 528-274.000.

Watkins, Julian W. Collapsible luggage for motorcycle. 4,125,213, Cl. 224-31.000.

Watson, Donald M.; and Nastasic, Vladimir, to Redpath Dorman Long (North Sea) Limited. Supports for maritime structures. 4,124,989, Cl. 405-225.000.

Weatherby, David E., to Schnabel Foundation Company. Corrosion protected earth tieback. 4,124,983, Cl. 405-260.000.

Weatherby, Inc.: *See*—
Jennie, Fred L., 4,125,054, Cl. 89-193.000.

Weatherford/DMC, Inc.: *See*—
Chammas, Edmond D., 4,125,161, Cl. 166-297.000.

Weatherford/Lamb, Inc.: *See*—
True, Martin E., 4,125,040, Cl. 81-52.500.

Weckwarth, Karl F.: *See*—
Atasoy, Kaya; Weckwarth, Karl F.; and Reinhardt, Walter, 4,125,602, Cl. 424-80.000.

Weed Eater, Inc.: *See*—
Ballas, George C., Sr., 4,124,938, Cl. 30-276.000.

Wegener, Carl J. Cooking vessel temperature control for microwave ovens. 4,125,752, Cl. 219-10.55E.

Wegmann & Co.: *See*—
Hesse, Gunther; Strassnitzki, Manfred; and von Dolsperg, Helmut, 4,125,055, Cl. 89-33.0SF.

Weihs, Edith. Transmission members for electro-vibratory massage appliances. 4,125,112, Cl. 128-32.000.

Weiner, Milton L.; Breidt, Peter, Jr.; and Higgins, Thomas W., to Mobil Oil Corporation. Packaging film with improved heat sealability. 4,125,662, Cl. 428-213.000.

Weir, Dean H., to Raymond Lee Organization, Inc. Spring biased swing board for projecting a diver. 4,125,256, Cl. 272-66.000.

Weiss, Carl D.: *See*—
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Weissman, Eugene Yehuda: *See*—
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Wells, Van D.: *See*—
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Wenner, Valentin: *See*—
Buhler, Marcel; Bohren, Hans-Ueli; Hodel, Theodore; and Wenner, Valentin, 4,125,527, Cl. 260-112.00R.

Wenstrom, Richard T.; Reinke, Theodore S.; Tolley, Calvert B.; and Brooks, J. Clayton, to Sea Savory, Inc. Method for separating edible crab meat from non-edible portions of cooked crabs. 4,124,920, Cl. 17-48.000.

West, William A., to Du Pont de Nemours, E. I., and Company. Process for the production of durable titanium dioxide pigment. 4,125,412, Cl. 106-300.000.

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CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977	B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976	B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976	B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977
B 66,272	4,014,978	Feb. 24, 1976	Mar. 29, 1977	B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976
B 71,613	4,008,393	Mar. 16, 1976	Feb. 15, 1977	B 373,344	4,053,067	Feb. 3, 1976	Oct. 11, 1977
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977	B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976	B 374,553	4,008,394	Mar. 30, 1976	Feb. 15, 1977
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976	B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976	B 376,749	4,014,856	Mar. 30, 1976	Mar. 29, 1977
B 105,006	4,007,074	Mar. 23, 1976	Feb. 8, 1977	B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977	B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977
B 141,968	4,013,442	Mar. 30, 1976	Mar. 22, 1977	B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976	B 380,137	4,014,802	Mar. 23, 1976	Mar. 29, 1977
B 159,570	4,036,870	Mar. 23, 1976	July 19, 1977	B 381,006	4,009,447	Apr. 6, 1976	Feb. 22, 1977
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976	B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976	B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976	B 382,120	4,013,639	Mar. 23, 1976	Mar. 22, 1977
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977	B 383,697	4,008,211	Feb. 17, 1976	Feb. 15, 1977
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977	B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976	B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976	B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976	B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976	B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976
B 236,266	4,013,624	Mar. 23, 1976	Mar. 22, 1977	B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977	B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976	B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976	B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976	B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976	B 388,675	4,012,459	Mar. 30, 1976	Mar. 15, 1977
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977	B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976	B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977	B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976	B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 281,162	4,009,481	Mar. 23, 1976	Feb. 22, 1977	B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976	B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977	B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976	B 391,828	4,014,933	Apr. 6, 1976	Mar. 29, 1977
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976	B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976	B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976	B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976	B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976	B 394,742	4,009,285	Apr. 13, 1976	Feb. 22, 1977
B 311,779	4,013,481	Feb. 10, 1976	Mar. 22, 1977	B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977	B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976	B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 328,065	4,014,752	Mar. 30, 1976	Mar. 29, 1977	B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 328,077	4,014,860	Apr. 13, 1976	Mar. 29, 1977	B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977	B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977	B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976	B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977	B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976	B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977	B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977	B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 335,783	4,013,744	Mar. 30, 1976	Mar. 22, 1977	B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976	B 401,221	4,014,791	Apr. 6, 1976	Mar. 29, 1977
B 337,023	4,013,188	Mar. 30, 1976	Mar. 22, 1977	B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977	B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976	B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977	B 402,657	4,013,665	Apr. 6, 1976	Mar. 22, 1977
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976	B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 344,669	4,013,655	Mar. 16, 1976	Mar. 22, 1977	B 403,076	4,014,917	Apr. 20, 1976	Mar. 29, 1977
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976	B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976	B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976	B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977	B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 354,222	4,012,305	Mar. 23, 1976	Mar. 15, 1977	B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976	B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976	B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 356,470	4,014,789	Mar. 23, 1976	Mar. 29, 1977	B 405,899	4,097,710	Mar. 23, 1976	Mar. 21, 1978
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977	B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976	B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976	B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 359,768	4,013,684	Mar. 30, 1976	Mar. 22, 1977	B 407,812	4,010,006	Mar. 23, 1976	Mar. 1, 1977
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976	B 408,123	4,014,887	Apr. 13, 1976	Mar. 29, 1977
B 361,954	4,014,753	Apr. 6, 1976	Mar. 29, 1977	B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977	B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976	B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 367,092	4,014,920	Apr. 13, 1976	Mar. 29, 1977	B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976	B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976	B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976	B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 369,373	4,013,683	Mar. 23, 1976	Mar. 22, 1977	B 412,124	4,007,000	Mar. 23, 1976	Feb. 8, 1977
B 369,379	4,013,754	Mar. 30, 1976	Mar. 22, 1977	B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976	B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977	B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 371,635	4,010,290	Mar. 23, 1976	Mar. 1, 1977	B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976
B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976
B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976
B 415,590	4,009,317	Mar. 23, 1976	Feb. 22, 1977
B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977
B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976
B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977
B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976
B 417,498	4,013,471	Mar. 23, 1976	Mar. 22, 1977
B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976
B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976
B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976
B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977
B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976
B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976
B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977
B 421,608	4,013,806	Mar. 23, 1976	Mar. 22, 1977
B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976
B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976
B 422,156	4,010,401	Mar. 23, 1976	Mar. 1, 1977
B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976
B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976
B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976
B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976
B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976
B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976
B 424,410	4,021,196	Mar. 30, 1976	May 3, 1977
B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976
B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977
B 425,285	4,014,676	Apr. 13, 1976	Mar. 29, 1977
B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976
B 426,157	4,013,714	Mar. 23, 1976	Mar. 22, 1977
B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976
B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976
B 426,274	4,014,949	Jan. 20, 1976	Mar. 29, 1977
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976
B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976
B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977
B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976
B 430,213	4,013,514	Mar. 30, 1976	Mar. 22, 1977
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976
B 431,797	4,007,290	Mar. 30, 1976	Feb. 8, 1977
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976
B 432,265	4,013,480	Mar. 23, 1976	Mar. 22, 1977
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976
B 433,707	4,013,594	Mar. 23, 1976	Mar. 22, 1977
B 433,892	4,016,061	Apr. 6, 1976	Apr. 5, 1977
B 433,930	4,012,324	Mar. 23, 1976	Mar. 15, 1977
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977
B 437,986	4,011,399	Apr. 20, 1976	Mar. 8, 1977
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977
B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977
B 440,632	4,014,955	Apr. 13, 1976	Mar. 29, 1977
B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976
B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976
B 441,543	4,014,755	Mar. 23, 1976	Mar. 29, 1977
B 441,605	4,026,862	Feb. 3, 1976	May 31, 1977
B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976
B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977
B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976
B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976
B 442,431	4,011,260	Mar. 23, 1976	Mar. 8, 1977
B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977
B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976
B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976
B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 444,078	4,014,854	Mar. 23, 1976	Mar. 29, 1977
B 444,294	4,013,634	Mar. 30, 1976	Mar. 22, 1977
B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976
B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977
B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976
B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976
B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976
B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977
B 446,956	4,014,765	Apr. 13, 1976	Mar. 29, 1977
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976
B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976
B 449,988	4,014,794	Mar. 30, 1976	Mar. 29, 1977
B 449,989	4,061,572	Mar. 30, 1976	Dec. 6, 1977
B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976
B 450,413	4,007,463	Mar. 23, 1976	Feb. 8, 1977
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976
B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976
B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976
B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976
B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977
B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977
B 452,293	4,014,726	Mar. 30, 1976	Mar. 29, 1977
B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 452,915	4,013,933	Mar. 30, 1976	Mar. 22, 1977
B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 452,944	4,009,773	Mar. 30, 1976	Mar. 1, 1977
B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977
B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 453,960	4,014,701	Apr. 13, 1976	Mar. 29, 1977
B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 454,833	4,008,733	Mar. 30, 1976	Feb. 22, 1977
B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 456,384	4,014,859	Apr. 6, 1976	Mar. 29, 1977
B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 456,905	4,013,431	Mar. 23, 1976	Mar. 22, 1977
B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976
B 459,190	4,010,786	Mar. 30, 1976	Mar. 8, 1977
B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976
B 459,408	4,018,890	Mar. 23, 1976	Apr. 19, 1977
B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977
B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976
B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977
B 461,257	4,078,715	Jan. 13, 1976	Mar. 14, 1978
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 461,685	4,013,661	Mar. 30, 1976	Mar. 22, 1977
B 461,752	4,016,541	Apr. 20, 1976	Apr. 5, 1977
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 462,030	4,009,342	Mar. 23, 1976	Feb. 22, 1977
B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976
B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976
B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976
B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977
B 463,591	4,015,051	Mar. 30, 1976	Mar. 29, 1977
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976
B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976
B 464,491	4,015,612	Mar. 30, 1976	Apr. 5, 1977
B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976
B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976
B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976
B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976
B 466,304	4,007,095	Mar. 23, 1976	Feb. 8, 1977
B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 466,419	4,011,087	Mar. 23, 1976	Mar. 8, 1977
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976
B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976
B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976
B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976
B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976
B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 468,421	4,014,739	Mar. 30, 1976	Mar. 29, 1977
B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977
B 469,036	4,005,926	Mar. 16, 1976	Feb. 1, 1977
B 469,228	4,052,954	Feb. 17, 1976	Oct. 11, 1977
B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976
B 470,305	4,014,043	Apr. 6, 1976	Mar. 22, 1977
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976
B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976
B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977
B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976
B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977
B 470,945	4,014,848	Apr. 13, 1976	Mar. 29, 1977
B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976
B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976
B 471,681	4,012,844	Apr. 13, 1976	Mar. 22, 1977
B 471,706	4,076,275	Mar. 16, 1976	Feb. 28, 1978
B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976
B 472,591	4,013,029	Apr. 6, 1976	Mar. 22, 1977
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976
B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976
B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976
B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976
B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976
B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 475,801	4,056,759	Mar. 30, 1976	Nov. 1, 1977
B 476,267	4,005,068	Apr. 6, 1976	Jan. 25, 1977
B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 476,542	4,013,549	Mar. 30, 1976	Mar. 22, 1977
B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976
B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976
B 476,776	3,998,715	Mar. 23, 1976	Dec. 21, 1976
B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976
B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976
B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976
B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976
B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976
B 477,892	4,010,355	Mar. 30, 1976	Mar. 1, 1977
B 478,234	4,010,421	Mar. 30, 1976	Mar. 1, 1977
B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976
B 478,759	4,055,681	Mar. 16, 1976	Oct. 25, 1977
B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976
B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976
B 479,502	3,999,030	Mar. 16, 1976	Dec. 21, 1976
B 479,681	D 242,672	Mar. 16, 1976	Dec. 14, 1976
B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977
B 480,114	4,001,327	Mar. 2, 1976	Jan. 4, 1977
B 480,251	4,008,700	Mar. 23, 1976	Feb. 22, 1977
B 480,287	4,006,029	Mar. 30, 1976	Feb. 1, 1977
B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976
B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976
B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976
B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976
B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976
B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976
B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976
B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976
B 480,749	3,999,207	Mar. 9, 1976	Dec. 21, 1976
B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977
B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976
B 481,190	4,013,468	Mar. 30, 1976	Mar. 22, 1977
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977
B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976
B 481,989	4,008,337	Mar. 23, 1976	Feb. 15, 1977
B 482,058	4,001,398	Mar. 2, 1976	Jan. 4, 1977
B 482,660	3,995,026	Feb. 10, 1976	Nov. 30, 1976
B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976
B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976
B 483,247	4,001,889	Apr. 13, 1976	Jan. 4, 1977
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976
B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976
B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976
B 483,746	4,014,923	Mar. 23, 1976	Mar. 29, 1977
B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976
B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976
B 484,067	3,992,374	Feb. 17, 1976	Nov. 16, 1976
B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976
B 484,121	3,997,770	Mar. 16, 1976	Dec. 14, 1976
B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976
B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976
B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977
B 484,437	4,013,740	Mar. 30, 1976	Mar. 22, 1977
B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976
B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976
B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976
B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976
B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977
B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976
B 485,926	4,006,357	Mar. 23, 1976	Feb. 1, 1977
B 485,972	4,017,472	Mar. 23, 1976	Apr. 12, 1977
B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976
B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977
B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976	B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976
B 487,078	4,012,895	Mar. 30, 1976	Mar. 22, 1977	B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976
B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976	B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976
B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976	B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976
B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976	B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976
B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976	B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976
B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976	B 497,293	4,011,412	Mar. 30, 1976	Mar. 8, 1977
B 487,467	4,014,847	Apr. 13, 1976	Mar. 29, 1977	B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976
B 487,529	4,022,750	Mar. 30, 1976	May 10, 1977	B 497,490	4,118,377	Mar. 23, 1976	Oct. 3, 1978
B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976	B 497,571	4,009,997	Mar. 23, 1976	Mar. 1, 1977
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976	B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976	B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976
B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976	B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976
B 488,836	4,013,121	Mar. 30, 1976	Mar. 22, 1977	B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976
B 489,290	3,998,081	Feb. 17, 1976	Dec. 21, 1976	B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977
B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976	B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976
B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976	B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977
B 489,485	D 243,266	Apr. 13, 1976	Feb. 1, 1977	B 498,288	4,013,657	Mar. 23, 1976	Mar. 22, 1977
B 489,550	4,000,710	Mar. 16, 1976	Jan. 4, 1977	B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976	B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976
B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976	B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 490,547	3,999,439	Feb. 24, 1976	Dec. 28, 1976	B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 490,551	D 243,168	Apr. 6, 1976	Jan. 25, 1977	B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976
B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976	B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976
B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976	B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976
B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976	B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976
B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976	B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 490,812	3,998,842	Mar. 30, 1976	Dec. 21, 1976	B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977
B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976	B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976	B 499,370	4,013,544	Mar. 30, 1976	Mar. 22, 1977
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976	B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976	B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977
B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976	B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976
B 491,455	3,991,167	Feb. 3, 1976	Nov. 9, 1976	B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976
B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976	B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976
B 491,618	4,007,950	Mar. 16, 1976	Feb. 15, 1977	B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976
B 491,650	3,999,044	Mar. 9, 1976	Dec. 21, 1976	B 500,959	4,014,853	Apr. 13, 1976	Mar. 29, 1977
B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976	B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976
B 491,711	4,053,467	Mar. 23, 1976	Oct. 11, 1977	B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976	B 501,128	4,072,723	Feb. 24, 1976	Feb. 7, 1978
B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976	B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976
B 491,906	D 242,223	Feb. 10, 1976	Nov. 9, 1976	B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976
B 492,039	3,997,541	Feb. 24, 1976	Dec. 14, 1976	B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976
B 492,093	4,003,658	Mar. 23, 1976	Jan. 18, 1977	B 501,379	4,013,696	Mar. 30, 1976	Mar. 22, 1977
B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976	B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976	B 501,482	4,012,650	Jan. 13, 1976	Mar. 15, 1977
B 492,373	4,010,908	Mar. 30, 1976	Mar. 8, 1977	B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976	B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976
B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976	B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976
B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977	B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976
B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976	B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976
B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976	B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976
B 493,254	D 243,267	Apr. 13, 1976	Feb. 1, 1977	B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976	B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976
B 493,463	4,013,510	Mar. 23, 1976	Mar. 22, 1977	B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 493,474	4,013,565	Mar. 23, 1976	Mar. 22, 1977	B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976
B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976	B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976
B 493,686	4,008,338	Mar. 23, 1976	Feb. 15, 1977	B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976
B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976	B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976
B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976	B 502,773	4,125,406	Jan. 13, 1976	Nov. 14, 1978
B 494,138	4,034,002	Mar. 23, 1976	July 5, 1977	B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976	B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976
B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977	B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976
B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976	B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977
B 494,439	4,057,521	Apr. 13, 1976	Nov. 8, 1977	B 503,371	4,009,401	Mar. 30, 1976	Feb. 22, 1977
B 494,440	4,056,502	Feb. 17, 1976	Nov. 1, 1977	B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976
B 494,450	4,079,029	Feb. 17, 1976	Mar. 14, 1978	B 503,456	4,007,702	Mar. 23, 1976	Feb. 15, 1977
B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976	B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976
B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976	B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976
B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976	B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976
B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976	B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976
B 495,124	4,060,968	Mar. 9, 1976	Dec. 6, 1977	B 503,776	4,016,000	Mar. 23, 1976	Apr. 5, 1977
B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976	B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976
B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976	B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976	B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976
B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976	B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976	B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976
B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976	B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976	B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976
B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976	B 504,405	4,007,401	Apr. 13, 1976	Feb. 8, 1977
B 495,781	4,013,699	Mar. 23, 1976	Mar. 22, 1977	B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976
B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976	B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976
B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976	B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976	B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976	B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976	B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976
B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976	B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 505,221	4,013,627	Mar. 30, 1976	Mar. 22, 1977	B 514,839	4,033,816	Mar. 2, 1976	July 5, 1977
B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977	B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976
B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976	B 515,216	4,076,261	Feb. 17, 1976	Feb. 28, 1978
B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976	B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976	B 515,368	4,014,733	Apr. 6, 1976	Mar. 29, 1977
B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976	B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976
B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976	B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976	B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976	B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976	B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976	B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976	B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976	B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 506,760	4,012,835	Apr. 13, 1976	Mar. 22, 1977	B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977	B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977	B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976	B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976	B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976	B 516,625	4,013,542	Mar. 30, 1976	Mar. 22, 1977
B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976	B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 507,166	4,014,738	Apr. 13, 1976	Mar. 29, 1977	B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976	B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 507,456	4,080,349	Mar. 9, 1976	Mar. 21, 1978	B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976	B 517,668	4,013,423	Apr. 6, 1976	Mar. 22, 1977
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976	B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976	B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976	B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976	B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977
B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977	B 518,076	4,014,914	Mar. 30, 1976	Mar. 29, 1977
B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976	B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976
B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976	B 518,326	4,008,282	Mar. 23, 1976	Feb. 15, 1977
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976	B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976	B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976	B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976	B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976
B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976	B 519,355	4,014,829	Apr. 13, 1976	Mar. 29, 1977
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976	B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976	B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 509,586	4,006,645	Feb. 3, 1976	Feb. 8, 1977	B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976
B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976	B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976
B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976	B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976
B 509,819	4,014,712	Apr. 13, 1976	Mar. 29, 1977	B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976
B 510,026	4,016,763	Apr. 13, 1976	Apr. 12, 1977	B 519,623	4,012,049	Apr. 6, 1976	Mar. 15, 1977
B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976	B 519,680	4,014,660	Mar. 30, 1976	Mar. 29, 1977
B 510,278	4,008,972	Mar. 30, 1976	Feb. 22, 1977	B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976	B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976	B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976
B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976	B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976
B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976	B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976
B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976	B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976
B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976	B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977
B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977	B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977
B 510,836	4,013,795	Mar. 23, 1976	Mar. 22, 1977	B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976	B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976	B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976
B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976	B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976
B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976	B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976
B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976	B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976
B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976	B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976	B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977
B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976	B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976	B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976
B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976	B 520,878	4,014,849	Apr. 6, 1976	Mar. 29, 1977
B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977	B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976	B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976	B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976
B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976	B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977
B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976	B 520,995	4,009,996	Mar. 23, 1976	Mar. 1, 1977
B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976	B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976	B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 512,779	4,014,897	Apr. 13, 1976	Mar. 29, 1977	B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976	B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976	B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976
B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976	B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976
B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976	B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976
B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976	B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976
B 513,134	4,006,764	Mar. 23, 1976	Feb. 8, 1977	B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976
B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976	B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 513,346	4,124,330	Mar. 9, 1976	Nov. 7, 1978	B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976
B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976	B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976
B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976	B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976
B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976	B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976
B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977	B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976
B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976	B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976
B 513,791	4,008,608	Mar. 30, 1976	Feb. 22, 1977	B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976
B 514,259	4,013,649	Mar. 23, 1976	Mar. 22, 1977	B 521,985	4,012,404	Mar. 23, 1976	Mar. 15, 1977
B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976	B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976	B 532,477	4,014,895	Apr. 13, 1976	Mar. 29, 1977
B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976	B 532,679	4,010,706	Apr. 6, 1976	Mar. 8, 1977
B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976	B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976
B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976	B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976	B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977
B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977	B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976
B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976	B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976
B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976	B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976
B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976	B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976	B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976
B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977	B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976
B 523,226	4,006,367	Mar. 23, 1976	Feb. 1, 1977	B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976	B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976	B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976	B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976	B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976	B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976	B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976	B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976	B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 524,849	4,014,938	Mar. 23, 1976	Mar. 29, 1977	B 534,680	4,014,904	Apr. 20, 1976	Mar. 29, 1977
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976	B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977	B 534,915	4,012,668	Mar. 23, 1976	Mar. 15, 1977
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976	B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976	B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976	B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976	B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 526,279	4,013,138	Apr. 13, 1976	Mar. 22, 1977	B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976	B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976	B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976	B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976	B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976	B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 526,654	4,011,534	Mar. 23, 1976	Mar. 8, 1977	B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 526,942	4,013,700	Mar. 30, 1976	Mar. 22, 1977	B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976	B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 527,040	4,013,515	Mar. 23, 1976	Mar. 22, 1977	B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976	B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976	B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976	B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976	B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976	B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976	B 536,923	4,007,828	Mar. 30, 1976	Feb. 15, 1977
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976	B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976	B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976	B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977	B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976	B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976	B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976	B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976	B 537,990	4,057,651	Jan. 13, 1976	Nov. 8, 1977
B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976	B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976
B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976	B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976	B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977	B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 529,214	4,013,004	Apr. 20, 1976	Mar. 22, 1977	B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976	B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976	B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 529,925	4,014,003	Mar. 30, 1976	Mar. 22, 1977	B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976	B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976	B 540,703	4,013,206	Apr. 13, 1976	Mar. 22, 1977
B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976	B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 530,263	4,009,736	Mar. 30, 1976	Mar. 1, 1977	B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 530,285	4,013,903	Apr. 6, 1976	Mar. 22, 1977	B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977
B 530,303	4,006,029	Mar. 23, 1976	Feb. 1, 1977	B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976	B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 530,437	4,014,857	Apr. 13, 1976	Mar. 29, 1977	B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976	B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976
B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977	B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976	B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977
B 530,709	4,012,944	Apr. 6, 1976	Mar. 22, 1977	B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976	B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976
B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977	B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976	B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976	B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976
B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976	B 542,258	4,013,536	Mar. 23, 1976	Mar. 22, 1977
B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976	B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976
B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976	B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976	B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976
B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976	B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976	B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976
B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976	B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977	B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976	B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977
B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976	B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977
B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976	B 545,344	4,012,746	Mar. 30, 1976	Mar. 15, 1977
B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976	B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977
B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977
B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976
B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976
B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976
B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976
B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976
B 546,677	4,015,654	Apr. 6, 1976	Apr. 5, 1977
B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976
B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976
B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977
B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976
B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976
B 554,655	4,015,048	Feb. 24, 1976	Mar. 29, 1977
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976
B 555,146	4,007,636	Apr. 20, 1976	Feb. 15, 1977
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 557,274	4,016,375	Mar. 23, 1976	Apr. 5, 1977
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976
B 557,721	4,013,435	Mar. 23, 1976	Mar. 22, 1977
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976
B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977
B 559,394	4,016,094	Apr. 20, 1976	Apr. 5, 1977
B 559,441	4,013,609	Mar. 23, 1976	Mar. 22, 1977
B 559,631	4,011,406	Mar. 23, 1976	Mar. 8, 1977
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976
B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976
B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976
B 561,165	4,013,002	Mar. 30, 1976	Mar. 22, 1977
B 561,166	4,011,809	Mar. 30, 1976	Mar. 15, 1977
B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977
B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976
B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976
B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977
B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 562,519	4,013,125	Mar. 30, 1976	Mar. 22, 1977
B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 564,255	4,015,996	Mar. 30, 1976	Apr. 5, 1977
B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 565,754	4,011,626	Mar. 30, 1976	Mar. 15, 1977
B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977
B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 567,076	4,011,187	Mar. 23, 1976	Mar. 8, 1977
B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977
B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 570,925	4,040,802	Mar. 23, 1976	Aug. 9, 1977
B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 572,726	4,015,020	Feb. 24, 1976	Mar. 29, 1977
B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 573,114	4,014,843	Apr. 6, 1976	Mar. 29, 1977
B 573,991	4,013,704	Mar. 30, 1976	Mar. 22, 1977
B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 575,761	4,013,123	Apr. 13, 1976	Mar. 22, 1977
B 575,776	4,013,124	Apr. 20, 1976	Mar. 22, 1977
B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 576,385	4,009,498	Mar. 30, 1976	Mar. 1, 1977
B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976
B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 579,153	4,013,745	Mar. 30, 1976	Mar. 22, 1977

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977
B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 581,564	4,036,653	Mar. 23, 1976	July 19, 1977
B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977
B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976
B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976
B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976
B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976
B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976
B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976
B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976
B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976
B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976
B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977
B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976
B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976
B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976
B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976
B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977
B 591,141	4,013,631	Mar. 23, 1976	Mar. 22, 1977
B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 593,781	4,015,953	Mar. 16, 1976	Apr. 5, 1977
B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 632,416	4,076,698	Mar. 9, 1976	Feb. 28, 1978
B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 750,679	4,007,049	Mar. 23, 1976	Feb. 8, 1977
B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF NOVEMBER, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bayer Aktiengesellschaft: *See*—
Brack, Alfred; and Schmitt, Ernst, Re. 29,834, Cl. 260-326.900.

BJ-Hughes Inc.: *See*—
Scott, Lyle B., Re. 29,830, Cl. 166-155.000.

Brack, Alfred; and Schmitt, Ernst, to Bayer Aktiengesellschaft. Cationic dyestuffs. Re. 29,834, Cl. 260-326.900.

Chemetron Corporation: *See*—
Moore, Donald G., Re. 29,837, Cl. 219-10.55B.

General Signal Corporation: *See*—
McEathron, Eugene D., Re. 29,831, Cl. 303-81.000.

Hayakawa, Toshio, to Matsushita Electric Industrial Co., Ltd. Printing mechanism. Re. 29,832, Cl. 400-320.100.

ICN Pharmaceuticals: *See*—
Witkowski, Joseph T.; and Robins, Roland K., Re. 29,835, Cl. 536-29.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Hayakawa, Toshio, Re. 29,832, Cl. 400-320.100.

McEathron, Eugene D., to General Signal Corporation. Fluid brake control system. Re. 29,831, Cl. 303-81.000.

Mlavsky, Abraham I., to Mobil Tyco Solar Energy Corporation. Tubular solar cell devices. Re. 29,833, Cl. 136-89.0PC.

Mobil Tyco Solar Energy Corporation: *See*—
Mlavsky, Abraham I., Re. 29,833, Cl. 136-89.0PC.

Moore, Donald G., to Chemetron Corporation. Electromagnetic oven system for automatically heating variable numbers and sizes of food items or the like. Re. 29,837, Cl. 219-10.55B.

Robins, Roland K.: *See*—
Witkowski, Joseph T.; and Robins, Roland K., Re. 29,835, Cl. 536-29.000.

Schmitt, Ernst: *See*—
Brack, Alfred; and Schmitt, Ernst, Re. 29,834, Cl. 260-326.900.

Schwartz, Martin L.: *See*—
Zinnes, Harold; Schwartz, Martin L.; and Shavel, John, Jr., Re. 29,836, Cl. 544-49.000.

Scott, Lyle B., to BJ-Hughes Inc. Cementing plug launching apparatus. Re. 29,830, Cl. 166-155.000.

Shavel, John, Jr.: *See*—
Zinnes, Harold; Schwartz, Martin L.; and Shavel, John, Jr., Re. 29,836, Cl. 544-49.000.

Warner-Lambert Company: *See*—
Zinnes, Harold; Schwartz, Martin L.; and Shavel, John, Jr., Re. 29,836, Cl. 544-49.000.

Witkowski, Joseph T.; and Robins, Roland K., to ICN Pharmaceuticals. 1,2,4-Triazole nucleosides. Re. 29,835, Cl. 536-29.000.

Zinnes, Harold; Schwartz, Martin L.; and Shavel, John, Jr., to Warner-Lambert Company. 4-Hydroxy-3-(3-isoxazolylcarbamoyl)-2H-1,2-benzothiazine 1,1-dioxides and process for their production. Re. 29,836, Cl. 544-49.000.

LIST OF DESIGN PATENTEES

American Cyanamid Company: *See*—
Grip, John A., 250,248, Cl. D9-44.000.

Antolino, Angelo, to New Colony Inventions, Inc. Combined liquid food separator and dispenser with attachable strainer. 250,244, 11-14-78, Cl. D7-64.000.

Atari, Inc.: *See*—
Thompson, Frederick W., 250,264, Cl. D14-96.000.

Battles, Isaiah T., Sr. Recreational trailer. 250,256, 11-14-78, Cl. D12-103.000.

Baughman, Daniel G. Button. 250,227, 11-14-78, Cl. D2-449.000.

Bebb, Richard H., to Imperial Chemical Industries Limited. Mop head. 250,245, 11-14-78, Cl. D7-178.000.

Bell & Howell Company: *See*—
Overman, John W., 250,266, Cl. D16-11.000.

Bond, Albert K., to Hewlett-Packard Company. Self-attaching probe for use in photoelectric monitoring of body extremities. 250,275, 11-14-78, Cl. D24-29.000.

Booty, Donald J., to Spartus Corporation. Digital clock. 250,252, 11-14-78, Cl. D10-15.000.

Booty, Donald J., to Spartus Corporation. Digital clock. 250,253, 11-14-78, Cl. D10-15.000.

Booty, Donald J., to Spartus Corporation. Digital clock. 250,254, 11-14-78, Cl. D10-15.000.

Borck, Dieter, to Keiper Trainingsysteme GmbH & Co. Exerciser. 250,284, 11-14-78, Cl. D34-5.00K.

Bracon Industries, Inc.: *See*—
Rath, Kenneth B.; and Rath, Joyce A., 250,273, Cl. D23-49.000.

Braginetz, Paul A. Display holder. 250,240, 11-14-78, Cl. D6-181.000.

Braginetz, Paul A. Display holder. 250,241, 11-14-78, Cl. D6-181.000.

Brigham, Robert J., Jr.; and Semple, Richard J. Golf club head. 250,282, 11-14-78, Cl. D34-5.0GH.

Cheng, Robin; and Cross, Kenneth M., to 3C Chemical Laboratories Pty. Limited. Holder for an aerosol can or the like. 250,250, 11-14-78, Cl. D9-224.000.

Chervenak, Robert A., to COMERCO, INC. Cabinet or similar article. 250,235, 11-14-78, Cl. D6-167.000.

Chromcraft Corporation: *See*—
Wilson, Robert L., 250,231, Cl. D6-56.000.

COMERCO, INC.: *See*—
Chervenak, Robert A., 250,235, Cl. D6-167.000.

Control Products, Inc.: *See*—
Dacal, Perfecto, 250,289, Cl. D48-20.00E.

Corning Glass Works: *See*—
Gerow, Cynthia S., 250,291, Cl. D59-2.00R.
Rothstein, Estelle G., 250,290, Cl. D59-2.00R.

Cress, William C., Jr.: *See*—
Douglas, Neil W.; and Cress, William C., Jr., 250,255, Cl. D10-64.000.

Cross, Kenneth M.: *See*—
Cheng, Robin; and Cross, Kenneth M., 250,250, Cl. D9-224.000.

Curator Mfg. Co., Inc.: *See*—
Waldman, Joel, 250,280, Cl. D27-51.000.

D. & C. Manufacturing Co., Inc.: *See*—
Douglas, Neil W.; and Cress, William C., Jr., 250,255, Cl. D10-64.000.

Dacal, Perfecto, to Control Products, Inc. Explosion proof high intensity discharge lamp for mines or the like. 250,289, 11-14-78, Cl. D48-20.00E.

De Zinno, Theophile L. Projection lens support enclosure for attachment to a television receiver. 250,263, 11-14-78, Cl. D14-84.000.

Douglas, Neil W.; and Cress, William C., Jr., to D. & C. Manufacturing Co., Inc. Electrical box setting gauge. 250,255, 11-14-78, Cl. D10-64.000.

Eastern Company, The: *See*—
Pastva, John V., 250,247, Cl. D8-339.000.

Flecken, Raimund, to J. Latscha Frankfurt KG. Multiple unit package of animal food or the like. 250,249, 11-14-78, Cl. D9-193.000.

Fossella, Gregory; and Mercadanti, Michael, to Itek Corporation. Camera-processor. 250,265, 11-14-78, Cl. D16-02.000.

General Dynamics Corporation: *See*—
Miles, William E., 250,295, Cl. D64-12.00B.

Gerow, Cynthia S., to Corning Glass Works. Decal for culinary ware. 250,291, 11-14-78, Cl. D59-2.00R.

Grip, John A., to American Cyanamid Company. Dispensing container. 250,248, 11-14-78, Cl. D9-44.000.

Hero, Franz; and Odermatt, Karl, to Interlubke Gebr. Lubke KG. Combined table, shelf and cabinet unit. 250,237, 11-14-78, Cl. D6-174.000.

Hesford, David J.; and Young, Robert W., to Otis Elevator Company. Wall of an elevator cab. 250,278, 11-14-78, Cl. D25-37.000.

Hewlett-Packard Company: *See*—
Bond, Albert K., 250,275, Cl. D24-29.000.

Horner, Robert W. Balancing skier toy. 250,287, 11-14-78, Cl. D34-15.00N.

Horner, Robert W. Balancing acrobat toy. 250,288, 11-14-78, Cl. D34-15.00N.

IMI Opella Limited of Hereford: *See*—
Jones, Wilfred L., 250,272, Cl. D23-25.000.

Imperial Chemical Industries Limited: *See*—
Bebb, Richard H., 250,245, Cl. D7-178.000.

Inatomi, Charles T., to Transaction Technology, Inc. Combined control and display panel. 250,260, 11-14-78, Cl. D14-40.000.

Interlubke Gebr. Lubke KG: *See*—
Hero, Franz; and Odermatt, Karl, 250,237, Cl. D6-174.000.

Itek Corporation: *See*—
Fossella, Gregory; and Mercadanti, Michael, 250,265, Cl. D16-02.000.

J. Latscha Frankfurt KG: *See*—
Flecken, Raimund, 250,249, Cl. D9-193.000.
Jones, Wilfred L., to IMI Opella Limited of Hereford. Faucet. 250,272, 11-14-78, Cl. D23-25.000.
Kabushiki Kaisha Sato: *See*—
Sato, Yo, 250,292, Cl. D64-10.000.
Keiper Trainingsysteme GmbH & Co.: *See*—
Borck, Dieter, 250,284, Cl. D34-5.00K.
Keyes Fibre Company: *See*—
Vigue, Henry R., 250,243, Cl. D7-38.000.
Keystone Products, Inc.: *See*—
Patch, Philip G., 250,259, Cl. D12-209.000.
Knobel, Gladys; and Prisland, Theodore. Scarf hanger. 250,242, 11-14-78, Cl. D6-247.000.
Kotula, Stine. Combined lounge chair, adjustable table and accessory shelf. 250,230, 11-14-78, Cl. D6-42.000.
Kroehler Mfg. Co.: *See*—
Opper, Donald H., 250,233, Cl. D6-63.000.
Lambert, Hubert L. Display cabinet or similar article. 250,236, 11-14-78, Cl. D6-173.000.
Laukhuf, Carolyn J.: *See*—
Laukhuf, Gaylord V., 250,281, Cl. D30-44.000.
Laukhuf, Gaylord V., to Laukhuf, Carolyn J. Mow-over rotary pet tie-out stake. 250,281, 11-14-78, Cl. D30-44.000.
Lawrence, William J., to Texas Instruments Incorporated. Calculator casing. 250,293, 11-14-78, Cl. D64-11.00B.
Lewis, Lloyd J.: *See*—
Pool, Albert E.; and Lewis, Lloyd J., 250,239, Cl. D6-181.000.
Long, Douglas G., to Sunbeam Corporation. Electrical facial brush. 250,228, 11-14-78, Cl. D4-14.000.
Lookatch, Gordon D. Article holder mounted on an automobile visor. 250,258, 11-14-78, Cl. D12-191.000.
Mankau, Dieter: *See*—
Prochnow, Claus; and Mankau, Dieter, 250,267, Cl. D16-42.000.
Mercadanti, Michael: *See*—
Fossella, Gregory; and Mercadanti, Michael, 250,265, Cl. D16-02.000.
Miles, William E., to General Dynamics Corporation. Segmented alphabet character V. 250,295, 11-14-78, Cl. D64-12.00B.
Minsky, Stuart. Folding bar table. 250,238, 11-14-78, Cl. D6-178.000.
Modular Engineering Corporation: *See*—
Pool, Albert E.; and Lewis, Lloyd J., 250,239, Cl. D6-181.000.
Moe, Timothy J.: *See*—
Stuart, Murray J.; and Moe, Timothy J., 250,251, Cl. D10-1.000.
Nash, Stanley P., to Schweiger Industries, Inc. Seat. 250,232, 11-14-78, Cl. D6-62.000.
New Colony Inventions, Inc.: *See*—
Antolino, Angelo, 250,244, Cl. D7-64.000.
Niesse, William H. Smoking pipe holder. 250,279, 11-14-78, Cl. D27-06.000.
Norton, John H. Goal post structure. 250,283, 11-14-78, Cl. D34-5.0VV.
Odermatt, Karl: *See*—
Hero, Franz; and Odermatt, Karl, 250,237, Cl. D6-174.000.
Opper, Donald H., to Kroehler Mfg. Co. Seat. 250,233, 11-14-78, Cl. D6-63.000.
Otis Elevator Company: *See*—
Hesford, David J.; and Young, Robert W., 250,278, Cl. D25-37.000.
Overman, John W., to Bell & Howell Company. Microform reader/-viewer or similar article. 250,266, 11-14-78, Cl. D16-11.000.
Pastva, John V., to Eastern Company, The. Cam latch. 250,247, 11-14-78, Cl. D8-339.000.
Patch, Philip G., to Keystone Products, Inc. Wheel design. 250,259, 11-14-78, Cl. D12-209.000.
Peters-Revington Corporation: *See*—
Ungaro, Nicholas A., 250,234, Cl. D6-153.000.
Pfohl, Arthur E. Mobile chair. 250,257, 11-14-78, Cl. D12-131.000.
Phillips, William W., to Shaymar, Inc. Speaker. 250,261, 11-14-78, Cl. D14-33.000.
Phillips, William W., to Shaymar, Inc. Stereo speaker unit. 250,262, 11-14-78, Cl. D14-33.000.
Pool, Albert E.; and Lewis, Lloyd J., to Modular Engineering Corporation. Self-service unit for merchandising food and beverages. 250,239, 11-14-78, Cl. D6-181.000.
Prisland, Theodore: *See*—
Knobel, Gladys; and Prisland, Theodore, 250,242, Cl. D6-247.000.
Prochnow, Claus; and Mankau, Dieter, to Rollei-Werke Franke & Heidecke. Photographic flash unit. 250,267, 11-14-78, Cl. D16-42.000.
Rath, Joyce A.: *See*—
Rath, Kenneth B.; and Rath, Joyce A., 250,273, Cl. D23-49.000.
Rath, Kenneth B.; and Rath, Joyce A., to Bracon Industries, Inc. Combined bathtub and shower stall. 250,273, 11-14-78, Cl. D23-49.000.
Richard Heinze GmbH & Co. KG, Firma: *See*—
Spellier, Roland, 250,269, Cl. D19-72.000.
Spellier, Roland, 250,270, Cl. D19-72.000.
Riker Laboratories, Inc.: *See*—
Werner, Gary M., 250,229, Cl. D4-32.000.
Rollei-Werke Franke & Heidecke: *See*—
Prochnow, Claus; and Mankau, Dieter, 250,267, Cl. D16-42.000.
Rose, Joseph. Calculator. 250,294, 11-14-78, Cl. D64-11.00B.
Rothstein, Estelle G., to Corning Glass Works. Decal for culinary ware. 250,290, 11-14-78, Cl. D59-2.00R.
Ryder, Francis E.: *See*—
Thomas, Michael D.; and Ryder, Francis E., 250,276, Cl. D24-99.000.
Ryder International Corporation: *See*—
Thomas, Michael D.; and Ryder, Francis E., 250,276, Cl. D24-99.000.
Sasson, Eli. Perpetual calendar. 250,268, 11-14-78, Cl. D19-25.000.
Sato, Yo, to Kabushiki Kaisha Sato. Portable labeler. 250,292, 11-14-78, Cl. D64-10.000.
Schweiger Industries, Inc.: *See*—
Nash, Stanley P., 250,232, Cl. D6-62.000.
Semple, Richard J.: *See*—
Brigham, Robert J., Jr.; and Semple, Richard J., 250,282, Cl. D34-5.0GH.
Shaw, Ted G., to Teddy Gee, Inc. Jacket, or similar article. 250,226, 11-14-78, Cl. D2-184.000.
Shaymar, Inc.: *See*—
Phillips, William W., 250,261, Cl. D14-33.000.
Phillips, William W., 250,262, Cl. D14-33.000.
Spartus Corporation: *See*—
Booty, Donald J., 250,252, Cl. D10-15.000.
Booty, Donald J., 250,253, Cl. D10-15.000.
Booty, Donald J., 250,254, Cl. D10-15.000.
Spellier, Roland, to Richard Heinze GmbH & Co. KG, Firma. Combined puncher, stapler and holder for desk utensils. 250,269, 11-14-78, Cl. D19-72.000.
Spellier, Roland, to Richard Heinze GmbH & Co. KG, Firma. Combined puncher, stapler and holder for desk utensils. 250,270, 11-14-78, Cl. D19-72.000.
Spigelman, Alan. Scissors. 250,246, 11-14-78, Cl. D8-57.000.
Stuart, Murray J.; and Moe, Timothy J., to Time Machine Inc., The. Clock casing. 250,251, 11-14-78, Cl. D10-1.000.
Sunbeam Corporation: *See*—
Long, Douglas G., 250,228, Cl. D4-14.000.
Takano, Atsushi. Fastener for bandages or the like. 250,277, 11-14-78, Cl. D24-99.000.
Teddy Gee, Inc.: *See*—
Shaw, Ted G., 250,226, Cl. D2-184.000.
Texas Instruments Incorporated: *See*—
Lawrence, William J., 250,293, Cl. D64-11.00B.
Thomas, Michael D.; and Ryder, Francis E., to Ryder International Corporation. Valve cap for a vacuum curettage vessel. 250,276, 11-14-78, Cl. D24-99.000.
Thompson, Frederick W., to Atari, Inc. Electronic control cabinet. 250,264, 11-14-78, Cl. D14-96.000.
Time Machine Inc., The: *See*—
Stuart, Murray J.; and Moe, Timothy J., 250,251, Cl. D10-1.000.
Transaction Technology, Inc.: *See*—
Inatomi, Charles T., 250,260, Cl. D14-40.000.
Tremonti, Charles J. Toy bank. 250,285, 11-14-78, Cl. D34-11.00R.
Ungaro, Nicholas A., to Peters-Revington Corporation. Server. 250,234, 11-14-78, Cl. D6-153.000.
Vigue, Henry R., to Keyes Fibre Company. Combined food and beverage tray. 250,243, 11-14-78, Cl. D7-38.000.
Waldman, Joel, to Curator Mfg. Co., Inc. Herb cleaner and carrying box. 250,280, 11-14-78, Cl. D27-51.000.
Werner, Gary M., to Riker Laboratories, Inc. Body scrubber. 250,229, 11-14-78, Cl. D4-32.000.
Whipple, Roy. Wood stove. 250,274, 11-14-78, Cl. D23-97.000.
Williams Gun Sight Co.: *See*—
Williams, Paul D., 250,271, Cl. D22-7.000.
Williams, Paul D., to Williams Gun Sight Co. Telescopic sight mount. 250,271, 11-14-78, Cl. D22-7.000.
Wilson, Robert L., to Chromcraft Corporation. Seat. 250,231, 11-14-78, Cl. D6-56.000.
Young, Robert W.: *See*—
Hesford, David J.; and Young, Robert W., 250,278, Cl. D25-37.000.
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3C Chemical Laboratories Pty. Limited: *See*—
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CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 14, 1978

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

10	4,124,902
79	4,124,903
413	4,124,904

CLASS 3

13	4,124,905

CLASS 4

172	4,124,906
172.19	4,124,907

CLASS 5

82 R	4,124,908
99 B	4,124,909

CLASS 8

11	4,125,367
42 B	4,125,368
115.6	4,125,369
137.5	4,125,370
176	4,125,371

CLASS 9

2 C	4,124,910
33	4,124,911

CLASS 12

126	4,124,912

CLASS 13

9 R	4,125,737

CLASS 15

42	4,124,913
93 R	4,124,914
105	4,124,915
339	4,124,916

CLASS 16

42 R	4,124,917
93 D	4,124,918

CLASS 17

1 F	4,124,919
48	4,124,920

CLASS 19

153	4,124,921

CLASS 23

230 B	4,125,372
	4,125,375
	4,125,377
230 HC	4,125,373
230 R	4,125,376
232 E	4,125,374

CLASS 24

115 R	4,124,922

CLASS 26

18.5	4,124,923

CLASS 28

220	4,124,924

CLASS 29

6.2	4,124,925
25.13	4,124,926
37 A	4,124,927
235	4,124,928
268	4,124,929
407	4,124,930
	4,124,931
527.4	4,124,932
578	4,124,933
590	4,124,934
602 R	4,124,936
630 R	4,124,935

CLASS 30

161	4,124,939
229	4,124,937
276	4,124,938

CLASS 33

379	4,124,940

CLASS 34

18	4,124,941
115	4,124,942

CLASS 35

8 A	4,124,943
13	4,124,944
39	4,124,945

CLASS 36

43	4,124,946

CLASS 40

453	4,124,947

CLASS 43

15	4,124,948

CLASS 44

51	4,125,382
66	4,125,383

CLASS 46

23	4,124,949
44	4,124,952
109	4,124,950
238	4,124,951

CLASS 47

66	4,124,953

CLASS 48

86 R	4,125,384

CLASS 49

236	4,124,954
237	4,124,955

CLASS 51

273	4,124,956

CLASS 52

183	4,124,957
285	4,124,958
298	4,124,959
583	4,124,960
592	4,124,961
702	4,124,962
742	4,124,963
745	4,124,964

CLASS 53

381 R	4,124,968
382	4,124,969
412	4,124,965
446	4,124,967
452	4,124,966

CLASS 55

269	4,125,385
493	4,125,386

CLASS 56

10.2	4,124,970

CLASS 57

9	4,124,971
207	4,124,973
328	4,124,972
339	4,124,974

CLASS 58

58	4,124,975

CLASS 60

204	4,124,976
282	4,124,977
410	4,124,978
599	4,124,979
700	4,124,980

CLASS 62

74	4,124,992
86	4,124,993
138	4,124,994
224	4,124,995
256	4,124,996
320	4,124,997
442	4,124,998

CLASS 64

17 R	4,124,999
23	4,125,000

CLASS 65

2	4,125,387
3 A	4,125,388
	4,125,389
34	4,125,390
60 D	4,125,391

CLASS 66

9 R	4,125,001
75.2	4,125,002

CLASS 68

208	4,125,003

CLASS 70

133	4,125,005
279	4,125,008

CLASS 71

3	4,125,392
	4,125,393
9	4,125,394
27	4,125,395
70	4,125,396
103	4,125,397
115	4,125,398
127	4,125,400

CLASS 72

9	4,125,004
169	4,125,006
273	4,125,007
350	4,125,009
453.06	4,125,010

CLASS 73

4 R	4,125,011
15 R	4,125,012
49.7	4,125,014
118	4,125,015
139	4,125,016
151	4,125,013
178 R	4,125,017
190 CV	4,125,018
194 EM	4,125,019
215	4,125,020
304 R	4,125,021
313	4,125,022
362 AR	4,125,023
425.4 R	4,125,024
655	4,125,025
724	4,125,027

CLASS 74

10 R	4,125,028
13	4,125,029
60	4,125,030
63	4,125,031
96	4,125,032
125.5	4,125,033
471 XY	4,125,034
480 R	4,125,035
604	4,125,036
713	4,125,026
732	4,125,037
869	4,125,038
874	4,125,039

CLASS 75

125	4,125,399

CLASS 81

52.5	4,125,040

CLASS 82

36 R	4,125,041
40 R	4,125,042
45	4,125,043

CLASS 83

356.3	4,125,044
389	4,125,045
437	4,125,046
581.1	4,125,047

CLASS 85

3 R	4,125,048
33	4,125,049
41	4,125,050
45	4,125,051

CLASS 89

33 SF	4,125,055
34	4,125,052
36 A	4,125,053
193	4,125,054

CLASS 90

7	4,125,056
11.58	4,125,057

CLASS 91

506	4,125,058

CLASS 92

51	4,125,059
59	4,125,060

CLASS 93

1 C	4,125,061

CLASS 96

49	4,125,401
53	4,125,402
114.1	4,125,403

CLASS 98

115 LH	4,125,062

CLASS 99

348	4,125,065
471	4,125,063
508	4,125,064
534	4,125,066
639	4,125,067

CLASS 100

19 R	4,125,068
45	4,125,069
116	4,125,070
191	4,125,071
207	4,125,072

CLASS 101

216	4,125,073
288	4,125,074

CLASS 104

7 B	4,125,075
165	4,125,076

CLASS 105

366 B	4,125,077

CLASS 106

54	4,125,404
	4,125,405
57	4,125,406
	4,125,407
62	4,125,408
66	4,125,409
90	4,125,410
291	4,125,411
300	4,125,412
308 Q	4,125,413

CLASS 108

29	4,125,078

CLASS 112

262	4,125,079

CLASS 113

1 R	4,125,080

CLASS 114

153	4,125,081
298	4,125,082

CLASS 115

14	4,125,083

CLASS 116

99	4,125,084
114 AH	4,125,085

CLASS 118

49.1	4,125,086
72	4,125,087
301	4,125,088
408	4,125,089

CLASS 123

3	4,125,090
	4,125,091
25 B	4,125,092
32 EA	4,125,093
32 ST	4,125,094
106	4,125,095
117 A	4,125,096
117 R	4,125,097
119 A	4,125,099
119 LR	4,125,098
124 R	4,125,100
139 AW	4,125,101
	4,125,102
146.5 A	4,125,103
179 L	4,125,104
191 L	4,125,105

CLASS 124

17	4,125,106

CLASS 126

270	4,125,107
	4,125,109
271	4,125,108

CLASS 128

2.05 T	4,125,111
2.06 E	4,125,110
32	4,125,112
260	4,125,113
280	4,125,114
327	4,125,115
404	4,125,116
481	4,125,117

CLASS 131

9	4,125,118

CLASS 134

100	4,125,119
126	4,125,120
167 C	4,125,121

CLASS 136

89 NB	4,125,414
89 PC	Re.29,833
205	4,125,122
234	4,125,738

CLASS 137

80	4,125,123
119	4,125,124
315	4,125,125
493.1	4,125,126
494	4,125,127
596	4,125,128
625.3	4,125,129

CLASS 138

121	4,125,130

CLASS 139

99	4,125,131
255	4,125,132
435	4,125,133
436	4,125,134
456	4,125,135

CLASS 140

105	4,125,136
147	4,125,137

CLASS 141

141	4,125,138
206	4,125,139

CLASS 148

1.5	4,125,415
12 F	4,125,416
131	4,125,417
175	4,125,418

CLASS 151

69	4,125,140

CLASS 156

277	4,125,419
384	4,125,420
	4,125,421
394	4,125,422
428	4,125,423
550	4,125,424
617 R	4,125,425
656	4,125,426
657	4,125,427

CLASS 160

91	4,125,141
291	4,125,142
348	4,125,143

CLASS 162

123	4,125,429
207	4,125,430
301	4,125,428

CLASS 164

4	4,125,144
252	4,125,145
437	4,125,146

CLASS 165

1	4,125,147
2	4,125,148
10	4,125,149
16	4,125,150
58	4,125,151
133	4,125,152
166	4,125,153
169	4,125,154

CLASS 166

97	4,125,155
155	Re.29,830
252	4,125,156
259	4,125,157
273	4,125,158
285	4,125,159
293	4,125,160
297	4,125,161
314	4,125,162
	4,125,163
315	4,125,164
323	4,125,165

CLASS 172

1	4,125,166

CLASS 174

36	4,125,739
52 PE	4,125,740
120 SC	4,125,741
211	4,125,742

CLASS 175

65	4,125,167

CLASS 176

3	4,125,431
22	4,125,432
68	4,125,433
76	4,125,434
78	4,125,435

CLASS 177

211	4,125,168

CLASS 178

18	4,125,743

CLASS 179

1.5 R	4,125,744
15 AT	4,125,747
15 BA	4,125,746
15 BY	4,125,745
18 BD	4,125,748
99	4,125,749

CLASS 180

6.5	4,125,169
69 C	4,125,170

CLASS 181

265	4,125,171

CLASS 182

19	4,125,172
63	4,125,173
128	4,125,174
194	4,125,175

CLASS 184

56 A	4,125,176

CLASS 188

62	4,125,177

CLASS 192

18 A	4,125,178
53 E	4,125,179
82 T	4,125,180
98	4,125,181
125 A	4,125,182

CLASS 193

37	4,125,183

CLASS 195

127	4,125,436

CLASS 198

442	4,125,184

CLASS 200

144 R	4,125,750

CLASS 202

117	4,125,437
248	4,125,438

CLASS 204

1 R	4,125,439
1 T	4,125,440
12	4,125,441
38 C	4,125,442
60	4,125,443
129.43	4,125,444
149	4,125,445
159.16	4,125,700
192 P	4,125,446
222	4,125,447
268	4,125,448
290 F	4,125,449
296	4,125,450
	4,125,451

CLASS 206

45.15	4,125,185
221	4,125,186
333	4,125,187
338	4,125,188
387	4,125,189
532	4,125,190

CLASS 208

8	4,125,452
11 R	4,125,453
65	4,125,454
108	4,125,455
254 R	4,125,457
309	4,125,458
	4,125,459

CLASS 209

8	4,125,460
140	4,125,456
609	4,125,191

CLASS 210

22 R	4,125,461
23 F	4,125,462
23 H	4,125,463
31 C	4,125,464
46	4,125,465
67	4,125,466
83	4,125,467
321 B	4,125,468
446	4,125,469

CLASS 211

14	4,125,192

CLASS 212

64	4,125,193

CLASS 214

17 DB	4,125,194
41 R	4,125,195
152	4,125,196
310	4,125,197
506	4,125,198
730	4,125,199

CLASS 215

246	4,125,200
330	4,125,201

CLASS 219

10.55 B	Re.29,837
	4,125,751
10.55 E	4,125,752
56	4,125,753
121 L	4,125,755
	4,125,757
121 LM	4,125,756
121 P	4,125,754
126	4,125,758
137 PS	4,125,759
388	4,125,760
544	4,125,761

CLASS 220

3	4,125,202
258	4,125,203
268	4,125,204

CLASS 221

129	4,125,205

CLASS 222

101	4,125,206
130	4,125,207
152	4,125,208
400.7	4,125,209
570	4,125,210

CLASS 224

5 V	4,125,211
9	4,125,212
31	4,125,213
42.08	4,125,214

CLASS 227

67	4,125,215

CLASS 228

4.5	4,125,216
169	4,125,217

CLASS 229

1.5 B	4,125,218
53	4,125,219
54 R	4,125,220

CLASS 235

92 FL	4,125,762
302	4,125,763
	4,125,764
463	4,125,765

CLASS 236

93 R	4,125,221

CLASS 237

1 A	4,125,222

CLASS 239

14	4,125,223
265.43	4,125,224
338	4,125,225
468	4,125,226

CLASS 241

186 R	4,125,227
243	4,125,228

CLASS 242

18 R	4,125,229
54 R	4,125,230
107	4,125,231

CLASS 244

12.3	4,125,232
33	4,125,233
111	4,125,234
129.5	4,125,235

CLASS 248

4	4,125,236
49	4,125,237
56	4,125,238
69	4,125,239
218.4	4,125,240
320	4,125,241
399	4,125,242
473	4,125,243
475 B	4,125,244

CLASS 249

33	4,125,245
58	4,125,246
66 R	4,125,247

CLASS 250

214 D	4,125,767
214 SF	4,125,766
227	4,125,768
272	4,125,769
	4,125,770
277 R	4,125,771
396 ML	4,125,772
413	4,125,773
439 P	4,125,774
504	4,125,775
508	4,125,776
551	4,125,777
574	4,125,778

CLASS 251

308	4,125,248

CLASS 252

27	4,125,470
31	4,125,471
32.5	4,125,472
33.6	4,125,479
62.57	4,125,473
62.62	4,125,474
89 R	4,125,475
115	4,125,476
301.1 W	4,125,477
316	4,125,478
414	4,125,480
431 C	4,125,481
447	4,125,482
455 R	4,125,483
522	4,125,484
546	4,125,485

CLASS 256

67	4,125,249

CLASS 260

3	4,125,491
9	4,125,492
17 A	4,125,494
17.4 BB	4,125,496
17.4 CL	4,125,493
17.4 ST	4,125,495
18 R	4,125,497
18 S	4,125,498
22 T	4,125,499
23 H	4,125,500
	4,125,501
29.3	4,125,502
29.7 NR	4,125,503
29.7 S	4,125,504
30.6 R	4,125,506
31.4 EP	4,125,507
33.2 R	4,125,505
	4,125,508
33.6 AQ	4,125,509
37 SB	4,125,510
40 R	4,125,511
42.14	4,125,512
	4,125,513
42.15	4,125,514
45.8 N	4,125,516
	4,125,517
45.8 NW	4,125,515
45.8 NZ	4,125,518
112 G	4,125,528
112 R	4,125,527
244.4	4,125,532
315	4,125,534
326 C	4,125,536
326 N	4,125,535
326.2	4,125,537
326.5 CA	4,125,538
326.9	Re.29,834
332.2 A	4,125,539
340	4,125,540
340.5 R	4,125,541
345.1	4,125,542
348.25	4,125,543
397.4	4,125,544
404.5	4,125,545
408	4,125,546
	4,125,547
	4,125,548
425	4,125,549
428	4,125,550
448.2 E	4,125,551
448.8 R	4,125,552
449 R	4,125,553
455 B	4,125,554
456 F	4,125,555
464	4,125,556
501.18	4,125,557
581	4,125,560
599	4,125,561
607 AR	4,125,562
645	4,125,563
655	4,125,564
668 D	4,125,565
676 R	4,125,566
677 R	4,125,567
681.5	4,125,568
683.9	4,125,569
830 TW	4,125,520
849	4,125,570
860	4,125,571
	4,125,572
876 R	4,125,573
884	4,125,574
923	4,125,575

CLASS 261

106	4,125,576

CLASS 264

0.5	4,125,577
29.5	4,125,578
32	4,125,579
34	4,125,580
49	4,125,581
73	4,125,582
90	4,125,526
98	4,125,583
142	4,125,584
173	4,125,585

CLASS 266

50	4,125,250

CLASS 269

45	4,125,251
47	4,125,252

CLASS 270

58	4,125,253
68 A	4,125,254

CLASS 271

251	4,125,255

CLASS 272

66	4,125,256
109	4,125,257
118	4,125,258

CLASS 273

73 A	4,125,259
80 R	4,125,260
86 B	4,125,261
101	4,125,262
293	4,125,263

CLASS 274

1 R	4,125,264

CLASS 277

152	4,125,265
153	4,125,266
188 A	4,125,267

CLASS 280

11.28	4,125,268
30	4,125,269
33.99 B	4,125,270
461 A	4,125,271
478 B	4,125,272
603	4,125,273
618	4,125,274
626	4,125,275
718	4,125,276
745	4,125,277

CLASS 285

61	4,125,278
69	4,125,279
137 R	4,125,280

CLASS 290

4 A	4,125,780

CLASS 292

148	4,125,281
336	4,125,282

CLASS 294

87 R	4,125,283

CLASS 296

62	4,125,284

CLASS 297

195	4,125,285
325	4,125,286
344	4,125,287
369	4,125,288

CLASS 299

4	4,125,289

CLASS 303

22 R	4,125,290
24 F	4,125,291
36	4,125,292
37	4,125,293
	4,125,294
81	Re.29,831
95	4,125,295
109	4,125,296

CLASS 307

11	4,125,781
35	4,125,782
116	4,125,783
218	4,125,784
221 D	4,125,785
	4,125,786
252 A	4,125,787
264	4,125,788
296 R	4,125,789

CLASS 308

3.6	4,125,297
189 R	4,125,298

CLASS 310

75 D	4,125,790
154	4,125,791
268	4,125,792

CLASS 312

184	4,125,299
214	4,125,301
242	4,125,302
244	4,125,303
257 SM	4,125,304
320	4,125,305
351	4,125,300

CLASS 313

95	4,125,793

CLASS 315

362	4,125,794
368	4,125,795

CLASS 316

1	4,125,306
19	4,125,307

CLASS 318

175	4,125,796
270	4,125,797
574	4,125,798
621	4,125,799
681	4,125,800
696	4,125,801

CLASS 320

35	4,125,802

CLASS 323

1	4,125,803

CLASS 324

6	4,125,804
54	4,125,805
158 D	4,125,806
230	4,125,807

CLASS 325

55	4,125,808
363	4,125,809
446	4,125,810

CLASS 328

160	4,125,811
162	4,125,812

CLASS 330

104	4,125,813
251	4,125,814

CLASS 331

8	4,125,815
94.5 F	4,125,816

CLASS 332

19	4,125,817

CLASS 333

70 T	4,125,818

CLASS 337

293	4,125,819

CLASS 338

4	4,125,820
32 R	4,125,821
34	4,125,822

CLASS 339

17 LC	4,125,308
18 P	4,125,309
92 M	4,125,310
97 R	4,125,311
107	4,125,312
176 M	4,125,313

CLASS 340

17 R	4,125,823
52 B	4,125,825
52 D	4,125,824
63	4,125,826
73	4,125,827
146.3 CA	4,125,828
324 AD	4,125,829
336	4,125,830
347 AD	4,125,831
347 DD	4,125,832
542	4,125,833
630	4,125,779

CLASS 343

5 EM	4,125,834
13 R	4,125,835
102	4,125,836
700 MS	4,125,837
	4,125,838
	4,125,839
807	4,125,840
909	4,125,841

CLASS 346

1	4,125,842
17	4,125,843
74.1	4,125,844
140 R	4,125,845

CLASS 350

3.60	4,125,314
96.10	4,125,315
96.13	4,125,316
356	4,125,318
362	4,125,319

CLASS 351

13	4,125,320

CLASS 353

44	4,125,321

CLASS 354

23 D	4,125,846
25	4,125,847
29	4,125,848
112	4,125,849
204	4,125,850
321	4,125,851
322	4,125,852

CLASS 355

4	4,125,322
8	4,125,323
23	4,125,324
26	4,125,325
74	4,125,326

CLASS 356

39	4,125,327
73	4,125,328
376	4,125,317
405	4,125,329
416	4,125,330

CLASS 357

36	4,125,853
41	4,125,854
45	4,125,855

CLASS 358

13	4,125,856
42	4,125,857
82	4,125,858
128	4,125,859
	4,125,860
133	4,125,861
140	4,125,862
195	4,125,863
298	4,125,864

CLASS 360

32	4,125,865
50	4,125,881
78	4,125,882
99	4,125,883

CLASS 361

79	4,125,884
114	4,125,885
139	4,125,886
331	4,125,887

CLASS 362

231	4,125,888
253	4,125,889
348	4,125,890

CLASS 364

200	4,125,891
	4,125,892
300	4,125,893
442	4,125,894
483	4,125,895
606	4,125,896
702	4,125,897
718	4,125,898
724	4,125,866
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	4,125,900
736	4,125,901
772	4,125,867
900	4,125,868
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	4,125,870
	4,125,871
	4,125,872
	4,125,873
	4,125,874

CLASS 365

1	4,125,875
3	4,125,876
190	4,125,877
208	4,125,878
236	4,125,879
242	4,125,880

CLASS 366

21	4,125,331
33	4,125,332
79	4,125,333
181	4,125,334
209	4,125,335

CLASS 400

124	4,125,336
320.1	Re.29,832

CLASS 403

11	4,125,337
169	4,125,338
348	4,125,339

CLASS 404

35	4,125,340
41	4,125,341

CLASS 405

66	4,124,981
150	4,124,985
166	4,124,991
167	4,124,990
212	4,124,986
225	4,124,989
228	4,124,988
232	4,124,982
260	4,124,983
276	4,124,987
293	4,124,984

CLASS 408

179	4,125,342

CLASS 416

17	4,125,343
183	4,125,344

CLASS 417

243 4,125,345
332 4,125,346

CLASS 418

83 4,125,347

CLASS 422

180 4,125,380
190 4,125,381
202 4,125,378
269 4,125,379

CLASS 423

84 4,125,586
139 4,125,587
150 4,125,588
245 4,125,589
292 4,125,590
328 4,125,591
344 4,125,5[illegible]
481 4,125,593
488 4,125,594
5[illegible] 4,125,595
522 4,125,596
573 R 4,125,597
580 4,125,598

CLASS 424

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71 4,125,601
80 4,125,602
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329 4,125,628

CLASS 425

64 4,125,348
192 R 4,125,349
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403 4,125,351
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576 4,125,353

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104 4,125,630
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659 4,125,679

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38 4,125,676
99 4,125,681
104 4,125,682
121 4,125,683
122 4,125,684
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194 4,125,687
199 4,125,638
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226 4,125,690

CLASS 431

11 4,125,354
71 4,125,355
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168 4,125,358
175 4,125,359
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354 4,125,361

CLASS 432

60 4,125,362
106 4,125,363
145 4,125,364
152 4,125,365
209 4,125,366

CLASS 521

32 4,125,486
51 4,125,490
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363 4,125,519
366 4,125,524
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9 4,125,705
17 4,125,706
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20 4,125,708
29 Re.29,835
53 4,125,709
121 4,125,710
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CLASS 542

421 4,125,712
426 4,125,713
429 4,125,714

CLASS 544

27 4,125,715
28 4,125,716
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145 4,125,718
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325 4,125,721
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336 4,125,724
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19 4,125,533
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133 4,125,531
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